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MONOGRAPH OF THE GALL-MAKING CYNIPIDÆ
(CYNIPINÆ) OF CALIFORNIA.

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INTRODUCTION.

All the gall-making species of the hymenopterous family Cynipidæ are included in the natural group or division Cynipinæ. Other members of the family, which is well represented in California, are parasitic on dipterous, coleopterous, and wood-boring hymenopterous larvae.* The gall-making species have been collected and studied by a number of American students, including Osten-Sacken, Bassett, Ashmead, Gillette and others, but previously no thorough systematic collecting of the galls or flies has ever been attempted to the writer's knowledge, and the descriptions of the California species are scattered through the various entomological periodicals of the past thirty-five or forty years.

In 1906, Miss Rose W. Patterson, (now Mrs. C. B. Blakeman), a student of entomology in Stanford University, under the direction of Professor Kellogg, began a systematic collection of the galls occurring in the vicinity of Stanford University and of San Jose, California, which extended through several years, the range of her collecting being widened on several occasions by excursions into the northern part of the state. To these collections there were added the contributions of students and other interested persons from different sections. Specimens bred from this material were carefully labelled and preserved by Miss Patterson with voluminous notes, but her removal from the university prevented the completion of the work of identification and description, and the whole collection, was recently turned over to the writer to be worked up. The

* They are also recorded from Hemerobius and Aphidæ.

Stanford collection, which includes eighteen undescribed species, forms the basis of the present work, in which it is attempted to bring together in monographic form all the Californian species. The table for genera and generic definitions have been adapted from Dalla Torre and Kieffer's monographs, from which much of the nomenclatorial data has also been derived. The author is greatly indebted to Professor Kellogg, under whose direction the work was performed, and to Mr. William A. Beutenmüller and Professor C. P. Gillette, who have compared specimens of doubtful identity with types in their possession, for helpful suggestions and advice during the progress of the work.

Fam. CYNIPIDÆ.

Subfam. CYNIPINÆ.

Cynipides, Psenides, Inquilinæ. T. Hartig, Zeits. f. Ent., vol. 2 (1840), p. 187, 197.

Cyniphoideæ. A. Forster, Verh. Zool. Ges. Wien, vol. 19 (1869), p. 329, no. 2.

Cynipina. C. G. Thomson, Opusc. Ent., vol. 8 (1877), p. 778.

Cynipinæ, Inquilinæ. Ashmead, Tr. Am. Ent. Soc., vol. 13 (1886), p. 60.

Cynipinæ. Dalla Torre, Cat. Hymen., vol. 2 (1893), p. 37.

Body rugose, shagreened or punctate, rarely entirely smooth. Scutellum without cups, sometimes with deep impression on disc but not cup-shaped. Wings usually with three more or less complete cubital cells, cubitus arising in the middle of the basal vein (in one species wanting altogether). Arcolet closer to base of radial cell than middle. Second segment of posterior tarsi without spine. Four first abdominal tergites of unequal size, second nearly always at least half as long as abdomen. Sternites ordinarily more or less visible. Hypopygium usually terminating in a point, ventral valve at least as long as broad, sometimes plowshare-shaped. Phytophagous species, living in galls.

KEY TO GENERA.

- | | | |
|---|--|----------------------------|
| 1 | Wings more or less foreshortened, not reaching beyond the middle of the abdomen..... | 2 |
| | Wings normally developed..... | 3 |
| 2 | Thorax covered with a dense pubescence, flat, closely punctate; mesonotum glabrous in the middle; antennae 12-segmented. Galls on <i>Quercus</i> | |
| | Thorax only sparsely pubescent, evenly rugose or wrinkled; antennae 13-14 segmented. Galls on <i>Quercus</i> | 5 <i>Trichoterax</i> Ashm. |
| 3 | 1st abdominal segment longitudinally striate, 2d and 3rd segments connate; face radiately striate; ventral valve short. Inquilines in galls on <i>Quercus</i> | 1 <i>Biorhiza</i> Westw. |
| | 1st abdominal segment smooth..... | 9 <i>Synergus</i> Hartig |
| 4 | Face with two parallel ridges from insertion of antennae to clypeus; antennae ♀ 12-14 segmented, ♂ 14-15 segmented; scutellum with basal foveæ; radial cell closed. Inquilines in galls on <i>Quercus</i> .. | 10 <i>Ceroptres</i> Hartig |
| | Face without such ridges..... | 5 |

- 5 Hypopygium plowshare-shaped, tarsal claws simple 6
 Hypopygium not usually produced, truncate and ending usually in a short
 spine (ventral valve)..... 8
- 6 Scutellum without foveæ; radial cell open on costal margin; abdomen
 microscopically reticulate. Galls on *Rosa*..... 15 *Lytorhodites* Kieff.
 Scutellum usually with basal foveæ; abdomen without microscopic
 reticulation..... 7
- 7 Radial cell closed. Galls on *Rosa*..... 14 *Rhodites* Hartig
 Radial cell open. Galls on *Quercus*..... 13 *Compsodryoxenus* Ashm.
- 8 Suture separating mesonotum and scutellum wanting, the latter without
 foveæ, anterior margin not elevated in a ridge, an arcuate transverse
 groove delimiting mesonotum posteriorly, parapsidal grooves wanting
 or not distinctly percurrent. Galls on *Quercus* 2 *Neuroterus* Hartig
 Suture separating mesonotum and scutellum, anterior margin of latter
 elevated to form a ridge..... 9
- 9 Body covered with silky pile, abdomen dorsally sometimes glabrous;
 radial cell open. Galls on *Quercus*..... 6 *Cynips* L.
 Abdomen glabrous, 2nd segment alone sometimes sparsely pubescent
 laterally at base..... 10
- 10 Radial cell closed; pronotum not medially contracted..... 11
 Radial cell open or partly open on costal margin; pronotum sometimes
 medially contracted..... 12
- 11 Mesonotum wholly smooth. Galls on *Rubus*..... 12 *Diastrophus* Hartig
 Mesonotum not wholly smooth; antennae 12-segmented. Inquilines in galls
 on *Rosa* and *Quercus*..... 11 *Periclistus* Forst.
- 12 2nd abdominal segment produced linguiform on dorsum; parapsidal grooves
 percurrent; base of scutellum with an arcuate transverse groove; ridges
 on metanotum arcuate; claws bidentate. Galls on *Quercus*.....
 3 *Diplolepis* L. Geoffr. 13
 2nd abdominal segment not produced linguiform..... 13
- 13 Claws simple, sometimes obscurely dentate, but then antennae slenderer
 at apical third than at middle, and metanotal ridges angularly curved.
 Galls on *Quercus*..... 8 *Callirhytis* Forst.
 Claws bidentate; antennae not slenderer at apical third than at middle;
 metanotal ridges straight and parallel, or arcuate..... 14
- 14 Scutellum basally with arcuate transverse groove; parapsidal grooves
 incomplete; head and thorax densely pubescent; Galls on *Quercus*.....
 4 *Disholcaspis* D. T. & Kieff.
 Scutellum with basal foveæ; parapsidal grooves percurrent. Galls on
Quercus..... 7 *Andricus* Hartig

1 BIORHIZA Westw.

Biorhiza, Westwood, Intr. Classif. Ins., vol. 2 Syn. (1840), p. 56.
 Philonix, A, Piteh, 5th Rep. Ins. N. York (1859), p. 3.

Wings in agamic generation wanting or very rudimentary, in sexual female very rudimentary, in male always present. Antennæ of female 13-14 segmented, of male 15-segmented, 3rd segment longer than the 4th, in male often strongly excised, succeeding segments progressively shorter but all longer than broad. Pronotum narrow in the middle, mesonotum in wingless generation only partly smooth and shining, in generation with developed and rudimentary wings usually entirely so, parapsidal grooves complete or little marked, scutellum in wingless generation with a transverse groove at base, in female with rudimentary wings, with weak foveæ separated by a carina, in generation with developed wings, with two sharply separated foveæ. Abdomen large, laterally compressed or globose, smooth or pubescent, ventral spine short. Tarsal claws bidentate.

***Biorhiza californica* (Beutenm.)**

Philonix californica, Beutenmüller, Ent. News, vol. 22 (1911), p. 69.

"Female. Head pitchy brown black, minutely rugose with scattered, short hairs. Antennæ 13-jointed; first joint stout, cylindrical; second joint shorter, stout and rounded at the tip; third joint very long and slender; fourth, fifth and sixth joints slender and shorter than the third; remaining joints gradually becoming shorter and thicker toward the thirteenth, all pitchy brown and pubescent. Thorax pitchy brown or dull rufous, evenly rugose, somewhat wrinkled and with a few scattered hairs. Parapsidal grooves very fine and somewhat lost in the rough surface anteriorly, convergent at the scutellum. Scutellum evenly rugose like the thorax, and of the same color. Abdomen compressed, convex at the sides and rather sharply keeled on the dorsum and venter, dark pitchy brown, smooth and shining. Legs pitchy brown, somewhat paler than the abdomen and pubescent. Wings aborted, not extending to the middle of the abdomen. Length 1 mm.

► "Gall. On the upper surface of the leaves of a species of white oak. Monothalamous. Rounded, flattened disc-like, becoming slightly elevated toward the middle. The sides are flat and very thin, and the gall rests closely on the leaf. The larva lives in the center of the elevated part. The color is pinkish or purplish, with the apex sometimes yellowish. Width, 3 to 4 mm. Height, 1 mm.

"Habitat. Kern Co., California, January."

(Wm. Beutenmüller.)

I have not seen specimens; the type is in the National Museum.

2 NEUROTERUS Hartig.

Cynips (part.), Linne, Syst. Nat. ed. 10 (1758), p. 343, 553.

Neuroterus, Spathegaster, Hartig, Zeits. f. Ent., vol. 2 (1840), p. 185, 192, 186, 194.

Ameristus, A. Forster, Verh. Zool. Ges. Wien, vol. 19 Abh. (1869), p. 330, 333.

Dolichostrophus, Ashmead, Tr. Am. Ent. Soc., vol. 14 (1887), p. 129 nota.

Head, thorax and scutellum smooth or microscopically reticulate and shining. Parapsidal grooves wanting or very indistinct. Mesonotum not separated from scutellum by a suture, posterior margin with an arcuate recess or indentation, a broad transverse groove at base of scutellum. Antennæ of female 13-14 segmented, of male 14-15 segmented. Abdomen large and subpetiolate in female, small and with a long petiole in male. Wings of male very long, usually shorter in female. Radial cell nearly always open and very long. In galls on *Quercus*.

***Neuroterus quercus-batatus* (Fitch).**

Cynips quercus-batatus, A. Fitch, 5th Rep. Ins. N. York (1859), p. 30.

Neuroterus batatus, G. Mayr, Gen. Gallenb. Cynip. (1881), p. 37.

Neuroterus quercus-batatus, Dalla Torre & Kieffer, Das Tierreich, lief. 24 Cynipidæ (1910), p. 334.

Female. Black, shining, mouth-parts, base of antennæ, legs beyond tibiæ and at joints above, tegulæ, pedicel and ovipositor brownish. Head faintly rugose, face pubescent, antennæ 13-segmented,

fuscous to black, except three first segments, which are brown, only slightly pubescent, 1st and 2nd segments stout, 2nd the same width throughout, 3rd segment longest, not as 1 and 2 together, 3rd and 4th very slender, becoming thicker and shorter outwardly to 7th, 8-12 subequal, last only a little longer than penultimate. Thorax microscopically reticulate, mesonotum without parapsidal grooves but with two rather large basal depressions separated by a median ridge, scutellum without basal foveæ, smooth, sparsely pubescent, sculpturing on mesonotum and scutellum excessively fine, on pleura and prothorax somewhat coarse. Abdomen smooth, shining, much compressed, about as broad as long, ovipositor exerted. Wings hyaline, pubescent, subcostal, radial, basal and cross-veins distinct, black, radial cell long, open, vein at base angulate, areolet distinct but small, cubitus indistinctly reaching basal. Length 1.75 mm.

Male. Microscopically reticulate or rugose, rather shiny. Head black, ocelli, mouth and antennæ at base brown, the latter 14-segmented, fuscous to black from 4th segment outwardly, 3rd a little longer than 1 and 2 together and excised at distal end, 4th about two-thirds of 3rd and subequal with 5th, following segments a little smaller and subequal except 13th, all somewhat pubescent. Prosternum blackish, pronotum narrow in the middle, at sides yellowish brown, reticulate and shining, the color extending up on to the scapule, mesothorax and scutellum smooth, shining, microscopically sculptured, the latter fuscous yellowish brown, mesopleura fuscous brown, coarsely sculptured, shining, metathorax sordid white, slightly rugose. Abdomen long petiolate, smooth, shining, at base sordid white to yellowish white, otherwise black, much compressed apically and pubescent at tip. Legs very pale yellowish, tips of tarsi black. Wings extending beyond abdomen more than its length, hyaline, pubescent, radial cell long and open, vein at base arcuate, cubital vein reaching basal, areolet distinct and large. Length 2 mm.

Gall. Early summer galls on under side of leaf of *Quercus douglasi*, a flat, irregular swelling, distorting the leaf, polythalamous, 8 mm. by 5 mm., and a sordid brown color. Late summer galls, from which adult flies emerge the following spring, small hard woody swelling in terminal twigs of *Q. lobata*, containing numerous long, oval larval cells imbedded in soft spongy interior of gall.

Habitat. Stevens Creek, beyond Cupertino, Cal. (R. W. Patterson.) San Jose, Cal. (Rose Patterson.)

Neuroterus saltatorius (Riley).

Cynips saltatorius (Hy. Edwards in MS), C. V. Riley, Tr. Ac. St. Louis, vol. 3 (1876), p. 213.

Neuroterus saltatorius, Ashmead, Tr. Am. Ent. Soc., vol. 14 (1887), p. 128.

Female. Black, smooth and polished, legs at joints sordid white. Head microscopically reticulate, antennæ 13-segmented, filiform, slightly incrassate towards tip, 1st and 2nd segments stout, 3rd longest, about twice as long as 2 or 4 but not as long as 1 and 2 together, succeeding segments subequal, the three last a trifle longer than preceding ones. Thorax smooth and flat, faintly sculptured, with two large depressions

posteriorly on either side of median line, which is ridged, scutellum rugose. Abdomen as broad as long, much compressed, ovipositor exerted. Wings hyaline, pubescent, veins blackish, radial cell long, open, vein at base slightly angulate, areolet present but two of the enclosing veins indistinct, cubitus not reaching basal vein. Length 1.5 mm.

Gall. Small, subglobular, 1.25-1.50 mm., pale reddish brown, with a small nipple at either pole; slightly sculptured.

Habitat. Stockton, Cal. (Hughes Ranch.)

3 DIPLOLEPIS L. Geoffr.

Cynips (part.), Linne, Syst. Nat. ed. 10 (1758), p. 343, 553.

Diplolepis (part.), L. Geoffroy, Hist. Ins., vol. 2 (1762), p. 309.

Dryophanta, A. Forster, Verh. Zool. Ges. Wien, vol. 19 Abh. (1869), p. 331, 334, 335.

Cheeks not more than half the length of the eye. Parapsidal grooves percurrent. Scutellum without foveæ, an arcuate transverse groove at base, rarely interrupted in the middle. Metanotal ridges curved. Radial cell open at the margin. Tarsal claws usually bidentate. Abdomen longer than vertically broad, 2nd tergite produced caudally linguiform. Head and thorax in agamous generation densely pubescent, antennæ 13-segmented and clothed with long, erect hairs. Body in sexual generation for the most part glabrous, antennæ of female 14-segmented, without long erect hairs, of male 15-segmented. Mesonotum smooth and shining. Abdomen in male petiolate. In galls on *Quercus*.

Diplolepis discus (Bass.)

Dryophanta discus, H. F. Bassett, Tr. Am. Ent. Soc., vol. 26 (1900), p. 326.

Diplolepis discus, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidæ (1910), p. 362.

"Head black. Antennæ thirteen jointed, joints one and two rather large, subequal, third long, fourth two-thirds as long as the third, remainder gradually shorter, all yellowish red. Thorax smooth, shining, with a few scattered hairs and deep parapsidal grooves. Scutellum slightly rugose. Foveæ not distinct. Abdomen dark, shining brown. Legs dark brown. Wings rather large; veins very pale, almost colorless. Areolet wanting. Cubitus nearly obsolete. Radial area open. Body .06, antennæ .05, wings .07.

"Galls. Among the galls sent me several years ago by Mrs. E. H. King, from Napa City, California, were a few specimens from which no insects appeared, but from which I removed three dead but perfectly developed individuals. The galls were circular, flat, sessile discs growing in clusters on the under sides of the leaves of some species of oak, closely resembling *Q. alba*; but I am not sure this oak grows in that section. The galls are hardly one-eighth of an inch in diameter, and except in size and color might be taken for what is, I think, called the 'blue spangle gall,' not uncommon on the white oak in the Atlantic States. It is smaller and lacks the blue color." (H. F. Bassett).

I have not seen examples of this species.

Diplolepis clavula (Beutenm.)

Dryopianta clavula, Beutenmüller, Ent. News, vol. 22 (1911), p. 67.

Female. Reddish brown, eyes, ocelli, mandibles, oral margin, occiput, a broad median stripe from occipital margin to the mouth (broken beneath ocelli), antennæ, prosternum, pronotum above and below, dorsal and subdorsal vittæ on mesonotum concurrent with median longitudinal lines and smooth lines over base of wings, mesopleura, base of scutellum and a median spot, metanotum and abdomen wholly black. Head reticulately rugose, face pubescent, antennæ 14-segmented, 1st segment stout, clavate, 2nd oval, 3rd long but not as long as 1 and 2 together, 4th as long as 3, succeeding segments to 9th progressively shorter, 9th and following segments subequal except the last, which is longer than penultimate by one-half, all rather pubescent. Pronotum narrow in the middle, rugoso-punctate, pubescent, mesonotum faintly rugose and deeply punctate, each puncture with a pale brown hair, parapsidal grooves distinct, reaching anterior margin, median longitudinal lines extending half-way to posterior margin, smooth lines over base of wings rather short, mesopleura smooth, shining black, densely pubescent, a triangular area beneath wings aciculate, scutellum rugose, pubescent, foveæ indistinct, a transverse arcuate groove at base with median carina, metanotum somewhat punctate, pubescent. Abdomen smooth, shining, somewhat compressed, the second tergite produced caudally acutely to a point, the posterior margin oblique, pubescent at base, 3rd tergite fairly wide, others concealed beneath, ovipositor sheath expanded at tip, with an apical tuft of hairs, ovipositor exerted. Legs fuscous brown and pubescent. Wings hyaline, quite pubescent, veins distinct, radial cell long, open at the margin, vein at base angulate and clouded with brown, arcolet moderate, cubitus nearly reaching basal vein, radius incassate at the tip, cubital cell with a large brown cloud at base and numerous spots at apex, a brownish cloud beneath 2nd cross vein, one at break in anal cell, and another at base of cubitus. Length 2 mm.

Gall. Small gourd or trumpet-shaped galls on the leaves of *Quercus lobata*, oval or subglobular outwardly, with long neck which is somewhat expanded at point of attachment. The gall is 7 mm. long, 2 mm. wide, the neck narrowing to less than 1 mm.; the walls quite thin, the large oval larval chamber lying directly beneath. It has a reddish appearance and is faintly rugose from minute crystalline bodies lying on the surface. It is also often covered with a grayish brown tomentum.

Habitat. Palo Alto, Cal. (Miss Bertha Wiltz.) Napa and Sonoma Counties, California (Beutenmüller).

Diplolepis echina (O.-S.)

Cynips echinus, Osten-Sacken, Tr. Am. Ent. Soc., vol. 3 (1870), p. 56.

Dryophanta echina, Beutenmüller, in litt.

Dryophanta speciosa, Beutenmüller, in litt.

Female. Reddish brown, eyes, ocelli, tips of mandibles, oral margin, antennæ distally from 2nd segment, dorsal and lateral vittæ on mesonotum concurrent with median pair of lines and lines over base of wings, and abdomen dorsally black or blackish. Head faintly rugose,

antennæ 14-segmented, filiform, outer third slightly thicker, 1st segment stout, obconic, 2nd subglobular, 3rd longest, nearly as long as 1 and 2 together, 4th and succeeding segments to 9th progressively shorter, 9-14 subequal, less than one-half as long as 3rd, all sparsely covered with appressed grayish hairs. Thorax faintly rugose and sparsely, in some parts rather thickly covered with appressed yellowish gray pubescence, pronotum narrow in the middle, parapsidal grooves on mesonotum distinctly percurrent, median longitudinal lines reaching half-way to posterior margin, smooth lines over base of wings distinct and long, scutellum without distinct foveæ, a rather narrow, arcuate transverse groove with smooth shining bottom at base. Abdomen smooth, shining, second tergite produced caudally linguiform almost to apex, pubescent at base, dorsal valve and sheath of ovipositor prominent, the latter with apical tuft of yellowish brown hair. Legs rather stout and clothed with a grayish pubescence. Wings hyaline, pubescent, veins brownish, distinct, radial cell open at the margin, vein at base only slightly bent, radius incrassate at tip just before costal margin, areolet distinct, cubitus nearly or quite reaching basal vein, a small brownish cloud near base of cubital cell, another beneath areolet, and still another at the break in anal vein. Length 2.5-3 mm.

Gall. Moderately large, reddish, echinus-shaped galls attached to the leaves of *Quercus douglasi*. Numerous pointed processes project from the more or less globular body of the gall, giving it the characteristic echinus appearance. The gall is composed of a crystalline substance said to be hardened gallic acid. Monothalamous. About 12 mm. in diameter.

Habitat. St. Helena, Cal. (Miss Julia Begley). Placer County, California (Osten-Sacken).

Diplolepis douglasi (Ashm.)

Holcaspis douglasii, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 127.
Holcaspis douglasi, Dalla Torre & Kieffer, Gen. Ins. Hymen. Fam. Cynip. (1902), p. 53.

Dryophanta douglasi, G. Mayr, Verh. Zool. Ges. Wien, vol. 52 (1902), p. 290.
Diplolepis douglasi, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidae (1910), p. 369.

Female. Very similar to *D. china*, from which it can scarcely be separated except on the character of the gall. In specimens before me I notice the following minor differences: antennæ black distally from 6th segment instead of from 2nd; abdomen black on dorsum only posteriorly; areolet rather indistinct and only the cloud near base of cubital cell present.

Gall. Pink, star-shaped galls occurring on leaves of *Quercus lobata*, composed of a crystalline substance similar to the material forming the gall of *D. china*, and covered with a pale bloom which imparts a lilac shade to the whole body. The gall is 8 mm. high and 10 mm. in diameter, the pedestal widening rapidly to the dorsal rim, which bears about eight irregular pointed projections forming the star. Mononthalamus. Hollow within, the oval larval chamber partly attached.

Habitat. San Jose, Cal. (R. W. Patterson.) Marin County, California (Beutenmüller).

Diplolepis dubiosa n. sp.

Female. Black, the antennæ, legs, tips of mandibles, tegulæ, post-scutellum and sheath of ovipositor luteous. Head faintly rugose and covered with closely appressed whitish hairs, antennæ 14-segmented, filiform, outer third slightly incrassate, 1st segment stout, obconic, 2nd suboval, 3rd longest, 4th and succeeding segments to 9th progressively shorter, 9th and following segments subequal, except the last, which is somewhat longer than penultimate. Pronotum narrow medially, mesonotum faintly reticulate, shining, parapsidal grooves distinct, reaching anterior margin, scutellum deeply rugose, foveæ distinct, large and broad, contiguous, separated only by a carina. Abdomen about as large as head and thorax together, smooth, shining, 2nd tergite produced caudally almost to apex, slightly pubescent laterally near the middle, spine of ventral valve moderate, pubescent. Wings hyaline, pubescent, veins pale brown to black, radial cell long, narrow, open at the margin, vein at base only slightly bent, areolet distinct but the enclosing nervures (except distal one) very delicate. Claws unidentate. Length 2 mm.

Male. Black, the antennæ, legs (except coxæ), tips of mandibles, palpi, tegulæ and petiole luteous. Head faintly rugose, face and cheeks covered with long, whitish hairs. Pronotum, mesonotum and pleura faintly reticulate, shining, metanotum faintly aciculate, pubescent, scutellum deeply rugose. Abdomen long, slender, compressed, pubescent laterally on 2nd segment. Antennæ 15-segmented, 1st segment obconic, 2nd subglobose, 3rd longest, succeeding segments to 13th progressively shorter, 13th and 14th subequal, 15th short and pointed. Length 1.75 mm.

Gall (Pl. XXIII, fig. 1). A small, brown, thin-shelled gall arising, several together, in the staminate ament of *Quercus agrifolia*. The gall is about 3 or 4 mms. long, rather angulate and more or less clavate. Polythalamous.

Habitat. Palo Alto, Cal. (R. W. Patterson.)

4 DISHOLCASPIS D. T. & Kieff.

Holcaspis, G. Mayr, Gen. d. Cynip. (1881), p. 9, 35.

Disholcaspis (n. n. for Holcaspis, preoccupied), Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidæ (1910), p. 371.

Agamic generation. Head and thorax covered with a rather dense pubescence, abdomen bare, the sides basally slightly pubescent. Checks less than half the length of the eyes. Antennæ 13-15 segmented, pubescent. Pronotum narrow in the middle. Parapsidal grooves incomplete, not reaching anterior margin. Base of scutellum with a transverse groove. Ridges of the metanotum arcuate. Radial cell long and open at the margin. Tarsal claws bidentate. Second tergite of abdomen not produced linguiform caudally. Sexual generation unknown. Galls on *Quercus*.

Disholcaspis truckeensis (Ashm.)

Holcaspis truckeensis, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 127.

Disholcaspis truckeensis, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidæ (1910), p. 380.

"Gall. An irregular, inflated, hard, woody gall, over an inch long and about half an inch in diameter, issuing from a slit in a terminal twig of *Quercus chrysolepis* var. *vacciniifolia*; polythalamous.

"Gall-fly. Female. Length, 3.4 mm. This species, in color and size, closely resembles *H. ficigera*, Ashmead, but differs as follows: The 14-jointed antennæ, except the first two joints, pleura, and metathorax blackish, shining; the rest of the insect—except the dorsum of the second abdominal segment, which is obfuscated—brownish yellow; the head and thorax punctate, and covered with a glittering white pubescence. Abdomen highly polished, bare, except the sides of second segment basally; spine of ventral valve short, stout, hairy. Wings hyaline, veins brown, arcolet distinct, cubital cell open at base, while the basal vein of radial cell is only obtusely angular.

"Type No. 3080, U. S. N. M.

"Two specimens, reared December 6th, 1880, from galls collected by Prof. J. H. Comstock, in California, October 16, 1880." (W. H. Ashmead.)

I have not seen examples of this species.

Disholcaspis eldoradensis (Beutenm.)

Holcaspis eldoradensis, Beutenmüller, Bul. Am. Mus. Nat. Hist., vol. 26 (1909), p. 38.

Female. Testaceous, eyes, ocelli, occiput, anterior margin of face, antennæ distally from 8th segment, pecten, dorsal and subdorsal vittæ on mesonotum concurrent with median longitudinal lines and lines over base of wings, median vitta on metanotum and dorsal valve black, vertex and front of head, tibiæ and tarsi of legs, and abdomen dorsally fuscous. Head faintly rugose and covered with dense grayish pubescence, antennæ 14-segmented, 1st and 2nd segments stout, 2nd a trifle longer than broad, 3rd segment longest, longer than 1 and 2 together, 4th segment as long as 3rd, succeeding segments to 10th progressively shorter, 10th and following segments subequal except the last, which is somewhat longer than penultimate; all the segments sparsely pubescent. Thorax coarsely punctate and covered with pubescence, parapsidal grooves on mesonotum indistinct, median longitudinal lines reaching half-way to posterior margin, smooth lines over base of wings distinct, scutellum rugose, foveæ inconspicuous, long, narrow and oblique. Abdomen smooth and shining, much compressed, 2nd segment reaching half-way to apex, pubescent at base, 3rd, 4th and 5th segments fairly broad, dorsal and ventral valves thickly pubescent. Wings hyaline, pubescent, veins heavy, black, radial cell long, open at the margin, vein at base of cell decidedly angulate, radius itself almost straight, arcolet rather large, cubitus not quite reaching basal nervure. Claws simple Length 2.5-3 mm.

Gall. Small, brown, cushion-shaped galls, sessile on twigs of *Quercus kelloggi* and *Quercus lobata*, hard and woody with the base broadly inserted in a slit in the bark. The top is flat and much pitted. Length about 4 mm., breadth about 3 mm., height about 3mm.

Habitat. Stanford University, Cal. (R. W. Patterson). Sonoma County, California. (Beutenmüller).

Disholcaspis chrysolepidis (Beutenm.)

Holcaspis chrysolepidis, Beutenmuller, Ent. News, vol. 22 (1911), p. 68.

Female. Very similar to *D. eldoradensis*, from which it can scarcely be separated, except on the character of the gall. Specimens before me show the following differences: parapsidal grooves deep and distinct, reaching half-way to anterior margin, pubescence on the thorax less abundant.

Gall. Galls sessile on the twigs of *Quercus chrysolepis* and *Quercus dumosa* and massed together around the stem, 15 to 30 in a mass; very irregular but more or less cushion-shaped outwardly and rugose, 3-4mm. in diameter, this portion of the gall surmounting smooth, lobular enlargements, sometimes arranged in a rosette. Sometimes the galls are elevated or arranged palisade-like, the outer face rough, the sides smooth, and with a median constriction. They are described as reddish or beef colored when fresh. Monothalamous, with a large internal pupal cell.

Habitat. Alma Soda Springs, Cal. (W. R. Dudley). Placer County, California. (Beutenmüller.)

5 **TRICHOTERAS** Ashm.

Trichoteris, Ashmead, Psyche, vol. 8 (1897), p. 67.

Trichoteris, Ashmead, Psyche, vol. 10 (1903), p. 150.

Head and thorax closely punctate, opaque, and densely pubescent. Antennæ of female 12-segmented, 3rd segment a little shorter and thicker than 4th equal to 5th, succeeding segments to 9th becoming gradually shorter, 9th to 11th only a little longer than thick, 12th as long as 10 and 11 together. Disc of the mesopleura bare, smooth and shining. Scutellum cushion-shaped, a little longer than wide, with two smooth, lunate foveæ at base. Tarsus of hind legs not longer than tibia, claws with a tooth at base beneath.

Trichoteris coquilletti Ashm.

Trichoteris coquilletti, Ashmead, Psyche, vol. 8 (1897), p. 67.

"Galls. Small, brown, sub-opaque, globular galls, averaging from 6 to 8 mm. in diameter, and internally with a central kernel or larval cell held in place by radiating filaments.

"These galls were collected by Mr. D. W. Coquillett, at Los Angeles, California, from the upper surface of the leaves of an unknown oak, who forwarded them to the Department of Agriculture, where three specimens of the gall-wasp were reared. Structurally and in general appearance the galls very closely resemble *Dryophanta polita* Bass., but the sub-apterous wasp is quite different from that species.

"Agamous female. Length 2.5 mm. Head and thorax ferruginous, closely punctate, and very hairy; prosternum and pleura blackish; legs fusco-piceous, the articulations paler.

"Antennæ 12-jointed, shorter than the body, the scape fully as long as the first joint of flagellum, obconical, and much stouter, pedicel one and one-half times as long as thick, 2nd joint of flagellum distinctly longer than either the 1st or 3rd joint; 4th joint of flagellum a little shorter than the 3rd, the 5th and following joints gradually shortening, the penultimate joint being scarcely longer than thick, the last joint fully as long as the first joint of flagellum, or twice as long as the penultimate. Wings abbreviated, narrowed and not extending beyond tip of abdomen, the veins dark brown, the marginal cell open, the areolet indicated by the union of the surrounding nervures. Abdomen black, polished, pubescent along the sides towards base, and as long as the head and thorax together, compressed and viewed from the side it is as broad as long, the hypopygium armed at tip with a long spine.

"Hab. Los Angeles, California.

"Type No. 3498, U. S. N. M.

"Described from 3 female specimens bred Nov. 26 and 29 and Dec. 6, 1892." (W. H. Ashmead).

I have not seen examples of this species.

6 CYNIPS L.

Cynips (part.), Linne, *Syst. Nat.*, ed. 10 (1758), p. 343, 553.

Cynips (part.), T. Hartig, *Zeits. f. Ent.*, vol. 2 (1840), p. 185, 187.

Cynips, Forster, *Verh. Zool. Ges. Wien*, vol. 19 Abh. (1869), p. 331, 335.

Cynips, G. Mayr, *Gen. d. Cynip.* (1881), p. 28.

Diplolepis (part.), L. Geoffroy, *Hist. Ins.*, vol. 2 (1762), p. 308.

Agamic generation. Body densely pubescent throughout, abdomen dorsally sometimes more or less bare. Antennæ filiform, 12-15 segmented, without long, erect hairs. Pronotum narrow in the middle. Parapsidal grooves percurrent. Scutellum with two basal foveæ, separated by a median carina. Metanotal ridges parallel. Radial cell open at the margin. Tarsal claws bidentate.

Cynips canescens (Bass.)

Holcaspis canescens, H. F. Bassett, *Tr. Am. Ent. Soc.*, vol. 17 (1890), p. 66.

Disholcaspis canescens, Dalla Torre and Kieffer, *Das Tierreich*, lief. 24 *Cynipidæ* (1910), p. 378.

Female. Reddish brown, eyes, ocelli, tips of mandibles, antennæ distally from 8th segment and a spot on 1st, prosternum, 1st abdominal segment, tarsi and ventral valve fuscous to black, clothed with pale grayish pubescence throughout except abdomen dorsally, which is bare. Head faintly rugose, antennæ 14-segmented, filiform, 1st and 2nd segments stout, 3rd segment longest, longer than 1 and 2 together, and a little longer than 4th, succeeding segments progressively shorter, the last in some specimens indistinctly divided and longer than penultimate. Pronotum narrow in the middle, mesonotum punctate, each puncture bearing a hair, parapsidal grooves reaching about half-way to anterior margin, median longitudinal lines extending about

half-way to posterior margin, smooth lines over base of wings distinct and broad, mesopleura and scutellum punctate, basal foveæ on latter obsolete. Abdomen compressed, dorsally bare, smooth and shining, ridged apically, pubescent at sides and beneath, 2nd segment occupying about one-half its length, 3rd tergite distinct, only sternites of following segments visible, dorsal and ventral valves prominent and pubescent. Wings hyaline, pubescent, veins prominent, radial cell open at margin, vein at base angulate, arcolet large, cubitus not reaching basal vein. Length, 4 mm.

Gall. Brownish, globular galls, about 10 mm. in diameter, occurring singly or in clusters on the twigs of *Quercus douglasi*. Sometimes a little irregular in shape, not much roughened, and covered with a yellowish brown fuzz. Monothalamous, with a large, globular larval chamber, quite distinct from the cortical layer and held in place by loose, spongy tissue.

Habitat. Hornitos, Cal. (Miss Hazel Engebretsen).

Cynips corallina (Bass.)

Holcaspis corallinus, H. F. Bassett, Tr. Am. Ent. Soc., vol. 17 (1890), p. 66.

Holcaspis corallina, Dalla Torre, Cat. Hymen., vol. 2 (1893), p. 55.

Disholeaspis corallina, Dalla Torre and Kieffer, Das Tierreich, Hef. 24 Cynipidæ (1910), p. 377.

Female. Very similar to *C. canescens*, but the pubescence is regularly more extensive on abdomen, only a small rhomboidal area dorsally on second segment remaining bare. The antennæ are brownish throughout, the basal segments darker, but light at the joints. The abdomen is not compressed apically but rotund, and all the tergites are visible.

Gall. Pale yellowish, globular galls, about 12 mm. in diameter, found on the twigs of *Quercus douglasi*. The galls are pointed at the poles and the surface is roughened by irregular ridges, or bears short, blunt tubercles giving it the appearance of coral.

Habitat. Mt. Diablo, California. (Harold Morrison.)

Cynips multipunctata (Beutenm.)

Dryophanta multipunctata, Beutenmuller, Ent. News, vol. 22 (1911), p. 67.

Female. Reddish brown, eyes, ocelli, tips of mandibles, face medially, pecten, dorsal and subdorsal vittæ on mesonotum concurrent with median longitudinal lines and lines over base of wings, abdomen dorsally, sometimes entirely black or blackish. Head broad, bulged beyond the narrow eyes, faintly rugose and punctate, with a thick covering of pale yellowish pubescence, antennæ 14-segmented, 1st and 2nd segments brown, following segments brownish black, 1st to 4th segments light brown distally, 1st and 2nd segments as usual stout, 3rd segment longest, longer than 1 and 2 together and a trifle longer than 4th, the following segments progressively shorter except the last, which is one-third longer than penultimate. Thorax faintly rugose and punctate, pubescent, except on median longitudinal lines which are bare, parapsidal grooves complete, median longitudinal lines reaching more than half-way to posterior margin, smooth lines over base of

wings distinct and rather long, pleura pubescent, mesopleura spotted with black, scutellum rugose and punctate, each puncture bearing a hair as on head and mesothorax, black at base, foveæ indistinct. Abdomen smooth, shining, faintly punctate, all the segments clothed with long, straight, pale yellowish pile, but dorsally and laterally bare in spots, rotund but ridged dorsally, 2nd segment occupying half its length, 3rd and 4th segments also wide, ventral valve large, triangular, with broad apex, bearing a large tuft of hairs, dorsal valve also hairy at tip. Legs pale brown and clothed with hairs. Wings large, hyaline, pubescent, veins brownish black, subcostal, radial, anal and cross veins thickened, the radial vein incassate at tip, radial cell open and rather short, vein at base angulate and clouded, areolet large and distinct, cubital vein reaching almost to basal, clouded area at base of cubital and discoidal cells and at break in anal vein, the cubital cell with 12-15 black spots. Length 4.5 mm.

Gall. Small, dark brown, globular galls in clusters of ten to twelve on terminal twigs of *Quercus lobata*, 8 mm. in diameter, more or less irregular in shape due to compression, the exposed surface rugose. Monothalamous, the small, round larval cell, 2 mm. in diameter, imbedded centrally in spongy tissue.

Habitat. Palo Alto, Cal. (Miss Bertha Wiltz). Kern County, California. (Beutenmüller.)

Beutenmüller describes the gall of this species as "covered with a dense, short and compact woolly substance and hairs." He states also that it occurs on leaves. His specimens are obviously different from mine, although specimens of the fly from my collection which he has compared with those in his possession, he states are similar.

Cynips maculipennis (Gillette).

Holcaspis maculipennis, Gillette, Can. Ent., vol. 26 (1894), p. 236.

Disholcaspis maculipennis, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidæ (1910), p. 375.

Female. Rufous, antennæ and abdomen mixed with black, densely clothed with sordid white silky pubescence except on abdomen dorsally. Head broad, bulging beyond the eyes, faintly punctate, antennæ 14-segmented, filiform, 1st and 2nd segments stout, 3rd longest, succeeding segments to 10th progressively shorter, 10th and following segments subequal except the last, which is a trifle longer than penultimate. Pronotum narrow in the middle, mesonotum finely rugose, parapsidal grooves deep and reaching to anterior margin, median longitudinal lines extending half-way to posterior margin, smooth lines over base of wings distinct and rather broad, scutellum finely rugose, cushion-shaped, foveæ indistinct. Abdomen well developed, broader than long, slightly compressed, valves black. Wings large and rather broad, hyaline, veins brown with brownish cloud at base of cubital cell, another beneath areolet, and numerous small brown spots in cubital cell. Length 4.5 mm.

Gall. Large, globular galls on the leaves of *Quercus garryana* and of other species of oak, yellowish brown and covered with rather large, dark brown spots, about 30 mm. in diameter. The outer shell is very thin and the single larval chamber is held in place by radiating fibers.

Habitat. McConaughy (Siskiyou Co.), Cal. (R. W. Patterson).

Cynips heldae n. sp.

Female. Very similar to *C. multipunctata*, from which it can scarcely be separated, except on the character of the gall.

Gall (Pl. XXIII, fig. 2). A small gall, with very irregular shape, occurring on *Quercus lobata*; more or less cubical, with many ridged and pointed projections, about 8 mm. long and 5 mm. square. My specimens, which are old and dry, are brownish, but in its natural state the gall was probably reddish, and is composed of a crystalline substance similar to the material forming the gall of *Diplolepis echina*.

Habitat. Ukiah, Cal. (Miss Held).

Cynips kelloggi n. sp.

Female. Reddish brown, the eyes, ocelli, a spot on front of head, tips of mandibles, oral margin, prosternum, antennae distally from 7th segment, metathoracic carinae, abdomen dorsally at apex and dorsal valve, tibia of hind legs and tarsi black or blackish. Head rugoso-punctate, antennae 15-segmented, 1st segment obovate, 2nd oval, 3rd long, as long as 1 and 2 together, following segments to 10th progressively shorter, 11th to 15th subequal. Thorax rugose, pubescent, parapsidal and median grooves complete, median longitudinal lines reaching half-way to posterior margin, smooth lines over base of wings distinct, pleura smooth, shining, punctate in the middle, pubescent above and below, scutellum coarsely rugoso-punctate, pubescent, foveae rather large, oval, oblique, shallow, with smooth bottom, not approximate, metanotum rugose. Abdomen smooth and shining, 2nd segment occupying about one-half its length, 3rd segment wide but 4th and 5th narrow, all the segments laterally pubescent, sheaths of ovipositor projecting and with dorsal valve pubescent. Legs slightly pubescent, claws unidentate. Wings hyaline, pubescent, veins black or blackish, radial cell open at the margin, its basal vein arcuate, almost angulate, areolet distinct, eubital vein reaching basal. Length 2-3 mm.

Gall. An elongated swelling of the twig of *Quercus douglasi*, about 20 mm. long and 10 mm. in diameter, its outer covering the same as the bark of the twig. Polythalamous.

Habitat. Stevens Creek, beyond Cupertino, Cal. (R. W. Patterson).

7 ANDRICUS Hartig.

Cynips (part.), Linne, Syst. Nat., ed. 10 (1758), p. 553.

Andricus (part.), T. Hartig, Zeits. f. Ent., vol. 2 (1840), p. 185, 190.

Andricus, Aphilothrix, A. Forster, Verh. Zool. Ges. Wien, vol. 19 Abh. (1869), p. 331, 335, 336.

Andricus, G. Mayr., Gen. d. Cynip. (1881), p. 12.

Cheeks at most only half the length of the eyes. Antennæ of female 12-16 segmented, of male 14-17 segmented. Pronotum narrow in the middle. Mesonotum shagreened or nearly smooth, sometimes transversely folded. Parapsidal grooves usually percurrent. Scutellum with two basal foveæ, without median line on disc. Metanotal ridges parallel or arcuate. Radial cell elongate, open at the margin. Tarsal claws bidentate. Abdomen almost glabrous. Agamic and sexual generations.

Andricus quercus-californicus (Bass.)

Cynips quercus californica, H. F. Bassett, Can. Ent., vol. 13 (1881) p. 51.

Andricus californicus, G. Mayr, Gen. d. Cynip. (1881), p. 28.

Andricus (Callirhytis) californicus, Ashmead, Tr. Am. Ent. Soc., vol. 12 (1885), p. 291.

Female. Reddish brown, eyes, ocelli, tips of mandibles, 3rd to 6th and 1st antennal segments proximally and ventral valve black or blackish. Head, thorax and legs covered with yellowish white pubescence. Head faintly rugose, broad and bulging laterally beyond the eyes, antennæ 14-segmented, filiform, 1st and 2nd segments stout, 3rd long, longer than 1 and 2 together, succeeding segments to 9th progressively shorter, 9th and following segments subequal except the last, which is twice as long as penultimate. Pronotum narrow in the middle, faintly rugose, mesonotum shallowly punctate, parapsidal grooves incomplete, reaching slightly beyond the middle, median longitudinal lines extending half-way to posterior margin, smooth lines over base of wings long and thin, a median bare spot on pleura smooth and shining, scutellum cushion-shaped, rugose, with rather indistinct basal foveæ. Abdomen broad, smooth and shining, dorsally ridged at apex, 2nd segment occupying about half its length, pubescent at sides basally, ventral valve and sheath of ovipositor also pubescent. Wings hyaline, pubescent, veins brownish, radial cell rather short and open at the margin, vein at base angulate, areolet large, cubitus almost reaching basal vein. Length 5 mm.

Gall. The familiar "oak-apple;" large, smooth, yellowish white, globular galls found on the branches of *Quercus lobata*, 50 to 60 mms. or more in diameter, sessile, polythalamous, the numerous larval cells imbedded internally in a rather dense cellular tissue.

Habitat. Santa Rosa, Cal. (Miss Josephine Van Wormer).

Andricus chrysolepidis Ashm.

Andricus chrysolepidis, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 119.

"Gall. A very hard, ovate, or globular gall, with a nipple at apex and a centrally imbedded larval cell; externally it is covered with a dense, fine, short pubescence like the pubescence on a peach, although sometimes this is rubbed off. Diameter, 5-8 mm.

"Gallfly. Female. Length, 3 to 5 mm. Reddish brown, antennæ and legs brownish yellow, eyes and abdomen dark, reddish brown. Head and thorax closely punctate, sparsely pubescent. Antennæ 14-jointed, very slightly thickened at tips. The thorax, besides the two parapsidal grooves, which are obsolete anteriorly, has a median groove extending anteriorly for more than half length of the mesonotum, two short median grooves anteriorly on each side of this, and the usual groove on the shoulders. Scutellum cushion-shaped, rugose, the foveæ distinct, pleura finely, minutely rugose, slightly striated at base. Abdomen polished, the short apical segments under a high power show a fine, delicate punctuation; while the ventral valve projects but slightly. Wings glossy, hyaline, veins yellowish, areolet small; neither the apex of the submarginal nor the radial vein reach the margin.

"Types No. 3066, U. S. N. M.

"One female, reared from a gall found on *Quercus chrysolepis*, at Colfax, Placer County, California, October 8, 1885, by Mr. Albert Koebele; and two specimens reared January 18 and 29, 1886, from same galls. Other of the galls are numbered 3816 U. S. N. M." (W. H. Ashmead.)

I have not seen examples of this species.

Andricus congregatus Ashm.

Andricus congregatus, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 120.

"Gall. An irregular, rugose, yellowish brown woody swelling, containing numerous cells, growing apparently from the extreme tips of very slender twigs of *Quercus chrysolepis*, the gall appearing to have a long peduncle, or it may be at the apex of the petal of a leaf, the leaf in consequence being aborted. The gall is more or less contracted in the middle and varies in length from 2-4 cm. and in diameter from 1-2 cm.

"Gallfly. Female. Length, 2 mm. Pale brown or brownish yellow, the eight terminal antennal joints, the middle and posterior tibiæ, metathorax, abdomen dorsally, and wing veins brown. Head and thorax closely, uniformly punctate. Antennæ 14 or 15-jointed, depending upon whether the terminal joint, which presents a rather distinct suture, is counted as one or two joints. The terminal joints all appear delicately fluted. Mesonotum has three distinct grooves, extending its whole length, and the groove on the shoulder is long. Scutellum minutely rugose, the foveæ oblique, distinct, but rather widely separated. Wings hyaline, with short pubescence.

"Type. No. 3068 U. S. N. M.

"Seven female specimens, received from Prof. E. W. Hilgard, Oakland, California, and reared November 10, 1876. The gall also occurs on *Quercus agrifolia*, and Prof. Riley says "a woody deformation of the staminate aments and quite abundant on some trees." (W. H. Ashmead).

I have not seen examples of this species.

Andricus crystallinus Bass.

Andricus crystallinus, H. F. Bassett, Tr. Am. Ent. Soc., vol. 26 (1900), p. 319.

Female. Cherry red to reddish brown, eyes, oral margin, spot on front above the insertion of antennæ, antennæ distally from 7th segment and a band on segments 1, 3, 4 and 5, dorsal and subdorsal vittæ on mesonotum concurrent with median longitudinal lines and lines over base of wings, scutellum at base, metathorax largely, pedicel, abdomen dorsally at base and on 3rd, 4th and 5th segments, pecten, hind coxæ, tips of tarsi and dorsal valve black or blackish. Head minutely rugoso-punctate, face pubescent, antennæ 14-segmented, 1st segment obconic, 2nd oval, 3rd as long as 1 and 2 together, a trifle longer than 4th or 5th, succeeding segments to 10th progressively shorter, following segments subequal. Pronotum narrow in the middle, punctate, mesonotum also punctate, parapsidal grooves complete, median longitudinal lines reaching half-way to posterior margin, smooth lines over base of wings long and rather broad, pleura smooth and shining, pubescent on upper and lower margins, scutellum rugose, foveæ large, oval, deep, bottom smooth and shining, approximate, covered throughout with dense pubescence. Abdomen smooth and shining, 2nd segment occupying about four-fifths of its length, basally pubescent at sides, 3rd segment rather wide, 4th, 5th and 6th quite narrow, these segments minutely punctate, ovipositor sheaths exerted and pubescent, legs light brown, claws bidentate. Wings hyaline, pubescent, subcostal, radial, basal and anal veins heavy and brown, others rather faint, radial cell open at margin and rather long, its basal vein arcuate, arcolel indistinct, cubitus not reaching basal vein. Length about 2.25 mm.

Gall. Irregularly shaped palisadal galls, in clusters of 5 or 6, on under side of leaves of *Quercus dumosa*, *Quercus douglasi* and *Quercus agrifolia*? and binding leaves together. Outwardly fuzzy. The individual gall is about 7 mm. long and 2 to 3 mm. across.

Habitat. Jasper Ridge, in the vicinity of Stanford University, Cal. (R. W. Patterson). St. Helena, Cal. (Miss Julia Begley). Napa, Cal. (Bassett.)

Andricus pacificus Ashm.

Andricus pacificus, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 118.

Female. Reddish brown, eyes, ocelli, tips of mandibles, and tip of dorsal valve blackish, 1st abdominal segment more or less fuscous, legs and antennæ basally a yellowish brown. Head faintly rugose, pubescent, antennæ 14-segmented, 1st and 2nd segments stout, 3rd long, longer than 4th, succeeding segments to 10th progressively shorter, 10th and following segments subequal except last, which is a trifle longer than penultimate. Thorax faintly rugose, parapsidal and median grooves on mesonotum reaching half-way to anterior margin, median longitudinal lines extending half-way to posterior margin, smooth lines over base of wings distinct and long, pleura aciculate, scutellum deeply rugose, especially at apex, and pubescent, foveæ large, subcircular, shallow, with shining, punctate bottom, and contiguous. Abdomen

about equal in length to head and thorax together, 2nd segment extensive and succeeding segments, which are microscopically punctate, telescoped, occupying only a fourth its length, valves conspicuous. Wings glassy hyaline, pubescent, radial cell open at the margin, areolet large, cubitus not reaching basal vein, vein at base of radial cell arcuate. Length 2.5-3.5 mm.

Gall. Dark greenish or yellowish brown, drupe-like galls, 2 cm. in length and 1 cm. in width, arising from the leaf-buds of *Quercus chrysolepis*, pointed at apex and with more or less obvious nipple, surface rugose. Apparently monothalamous. The exit hole of the mature insect is at the base. Internally the gall is of a hard, pithy structure, and an elongated, cylindrical canal leads to the large centrally imbedded larval cell. These galls are described by Ashmead as smooth and sometimes polished.

Habitat. Stevens Creek, above Cupertino, Cal. (R. W. Patterson.) Placer County, California. (Ashmead.)

***Andricus dasydactyli* Ashm.**

Andricus dasydactyli, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 117.

"Gall. This gall, in structure, is very peculiar, and consists of an oblong or elongated, woody tube, in shape not unlike a date seed; it is two centimeters long by from one-half to three-fourths of a centimeter in diameter, one end being attached sessily to the branch and covered with long, brownish yellow wool. Internally there is a cylindrical hollow, which, however, does not extend its entire length, being interrupted or stopped up by the small larval cell which is situated near its center.

"Sometimes three or more of these galls occur close together on the branch, and with their woolly covering present a curious appearance. One of the specimens in the collection is almost globular, but all the others are as described above.

"Gall-fly. Female. Length 3.8 mm. Clear reddish brown; vertex of head and the extreme tip of abdomen dusky; antennæ and legs brownish yellow. Head and thorax minutely, finely punctate, the pleura with fine striæ. Antennæ 14-jointed, rather long, the 3rd joint one-third longer than 4th, the following to 8th gradually shortening, beyond this about equal, the terminal joint being slightly lengthened. The parapsidal grooves are only distinct on the posterior half of the mesonotum, entirely wanting anteriorly; anteriorly extending to about the middle of the mesonotum are two median, glabrous lines; posteriorly there is a long median grooved line, while the line on the shoulders is distinct; the scutellum is more coarsely rugose at the apex, the basal foveæ large, ovate, oblique, approximate, glabrous at bottom. The abdomen is slightly longer than the head and thorax together and of the usual shape. Wings glassy hyaline, only slightly pubescent, the veins pale yellowish, except the basal nervure and the vein at base of marginal cell, which are brown; this last vein is arcuate but not angulate. The areolet is large and the cubital cell is not quite closed.

"Type. No. 3063, U. S. N. M.

"Described from many female specimens, which issued at various dates between January 18, 1885 and February 11, 1886. The gall occurs in California on *Quercus chrysolepis*, and was sent to the Department of Agriculture by Mr. Albert Koebele." (W. H. Ashmead).

I have only seen specimens of the gall, which were collected from *Quercus chrysolepis*, in the Stevens Creek Canyon, above Cupertino, Cal. It is very characteristic and unmistakable.

***Andricus kingi* Bass.**

Andricus kingi, H. F. Bassett, Tr. Am. Ent. Soc., vol. 26 (1900), p. 316, 317.

Female. Brown, eyes, ocelli, tips of mandibles, tips of tarsi and dorsal valve black. Head finely reticulate, face a pale brown, without pubescence, antennæ 14-segmented, 1st and 2nd segments stout, 3rd segment long, nearly as long as 1 and 2 together, one-third longer than 4th, 4th and 5th subequal, succeeding segments to 9th progressively shorter, 9th and following segments subequal, all the segments more or less fuscous. Thorax finely reticulate and punctate, covered with a sparse pubescence, parapsidal grooves complete and deep, median longitudinal lines and smooth lines over base of wings rather indistinct, median longitudinal groove from posterior margin very indistinct, mesopleura smooth, shining, microscopically reticulate, pubescent below, scutellum rugose, basally with large, circular foveæ, shallow, with smooth bottom, and contiguous, separated only by a carina. Abdomen smooth, shining, compressed, 2nd segment occupying about one-half its length, following segments wholly visible, dorsal valve and ovipositor sheaths prominent, last segment reticulate, 3rd, 4th, 5th, 6th and margin of 2nd punctate. Wings hyaline, pubescent, with faint iridescence, radial cell open and rather long, areolet small, cubitus not reaching basal vein. Length 2mm.

Gall. Small, pink, cone-shaped galls on the under side of leaves of *Quercus lobata*, about 5mm. high and 4 mm. across the base, which is broad and rather saucer-shaped. The outer portion of the gall is conical, the sides curved inwards slightly. The larval chamber is near the apex, where the exit hole is found. Some of the galls, from which flies were bred in every way identical with those from typical specimens, are said to be whitish striped with red and on leaves of *Quercus douglasi*, but specimens are not at hand.

***Andricus parmula* Bass.**

Andricus parmula, H. F. Bassett, Tr. Am. Ent. Soc., vol. 26 (1900), p. 312.

Female. Ferruginous, the legs and antennæ yellowish brown, eyes, ocelli, tips of mandibles, tips of tarsi, abdomen dorsally at apex and ventral valve black. Head faintly rugose, face pubescent, antennæ 13-segmented, 1st and 2nd segments stout, 3rd segment long, only a little longer than 4th, 4th and 5th segments subequal, succeeding segments to 10th progressively shorter, 10th and following segments subequal, except last, which is twice as long as penultimate. Pronotum narrow in the middle, mesonotum coarsely reticulate, parapsidal grooves

incomplete, reaching but half-way to anterior margin, median longitudinal lines extending half-way to posterior margin, smooth lines over base of wings distinct, pleura finely striated, with a triangular smooth area posteriorly, scutellum rugose, sparsely pubescent, basal foveæ large, elliptic, oblique, with smooth bottom, not approximate, metanotal ridges only slightly curved, faced with black. Abdomen about as long as head and thorax together, smooth and shining, more or less lenticular in shape, second segment occupying half its length, 3rd segment rather broad, following segments narrow, ovipositor sheath exerted, concolorous. Wings rather opaque whitish, faintly iridescent, veins faint, yellowish, radial cell narrow, open at the margin, vein at base arcuate, almost angulate, areolet indistinct, cubitus not reaching basal vein. Length 2 mm.

Gall. Very small, flat, reddish, disc-shaped galls on the under side of leaves of *Quercus lobata*, about 3 mm. in diameter, slightly elevated in the center. Much smaller than gall of *Andricus pattersonæ* and quite distinct from it.

Andricus wisliceni Ashm.

Andricus wisliceni, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 119.

"Gall. A small, globular gall, with a slight projection at base where it is attached to the twig; it varies in color from a yellow brown to dark brown, and some are mottled with purple and brown. It is hard, and contains in the center a small larval cell; diameter, 3-4 mm.

"Gall-fly. Female. Length, 3 to 3.4 mm. Pale brownish yellow, almost devoid of pubescence, the abdomen polished and discolored with brown, eyes dark brown, the mandibles black. Head and thorax finely punctate, shining; in front of the anterior ocellus is a deep transverse foveæ, and there are some coarse scattered punctures on the mesonotum. Antennæ 14-jointed, the 3rd joint about one-eighth longer than the 4th, the joints from 7th to apex short, about twice as long as wide, dusky, and delicately fluted. Parapsidal grooves distinct, the groove on the shoulders very long, distinct, and a little bent anteriorly. Scutellum cushion-shaped, rugose, the foveæ at base large and distinct, separated only by a slight carina; pleura smooth, but under a high power showing faint delicate striæ. Wings hyaline, the pubescence short, veins, except the sub-marginal vein from the portion extending from the basal vein to apex, and the angulated cross vein at base of marginal cell, which are brownish or piceous, yellowish.

"Type. No. 3065, U. S. N. M.

"Nine female specimens, reared October 14, 1886, from the galls sent to the National Museum by Mr. Albert Koebele, collected in Sacramento County, California, on *Quercus wisliceni*." (W.H. Ashmead).

I have not seen examples of this species.

Andricus quercus-flocci (Walsh).

? *Cynips quercus lana*, A. Fitch, 5th Rep. Ins. N. York (1859), p. 34.

? *Cynips quercus lanæ*, Osten Sacken, Proc. Ent. Soc. Philad., vol. 1 (1861), p. 62.

Cynips quercus flocci, B. D. Walsh, Proc. Ent. Soc. Philad., vol. 2 (1864), p. 482.

Cynips (*Andricus*) *flocci* Osten Sacken, Proc. Ent. Soc. Philad., vol. 4 (1865), p. 352.

Andricus flocci, G. Mayr, Gen. d. Cynip. (1881), p. 28.

? *Andricus lana*, Ashmead, Tr. Am. Ent. Soc., vol. 12 (1885), p. 295.

Female. Black, ocelli, antennæ, legs distally from the coxæ, tegulæ and ovipositor sheath brownish. Head reticulately rugose, shining, face with whitish pubescence, antennæ 13-segmented, 3rd segment longest, not as long as 1 and 2 together and only a little longer than 4th, following segments progressively shorter except last, which is one and one-half times the length of penultimate, distal segments fuscous. Pronotum narrow in the middle, rugose and pubescent, mesonotum smooth and shining, or more or less shagreened, parapsidal grooves deeply impressed, complete, the median longitudinal lines reaching more than half-way to posterior margin, smooth lines over base of wings distinct and reaching anterior margin, pleura aciculate, scutellum rugose, slightly pubescent, basal foveæ large, shallow, with smooth bottom, approximate. Abdomen smooth, shining, greatly compressed apically, 2nd segment occupying more than half its length, pubescent at base, 3rd and following segments narrow, ventral valve perpendicular, reaching tergal line, ovipositor exerted and curving upward, ovipositor sheath pale, pubescent. Wings hyaline, pubescent, veins brown, radial cell long, open at the margin, vein at base arcuate, areolet small, cubitus not reaching basal vein. Length 2.25 mm.

Gall. A mass of twenty or more smooth, brown, elliptical or loaf-shaped galls, 2mm. high and 1 mm. in diameter, on under side of leaves of *Quercus lobata*, covered with reddish or yellowish wool. Monothalamous.

Habitat. Palo Alto, Cal. (Miss Bertha Wiltz.)

Andricus pattersonæ n. sp.

Female. Very similar to *A. kingi*, from which it can scarcely be separated, except on the character of the gall. Some of the specimens have the abdomen dorsally and the antennæ distally from 9th segment more or less blackish, and dorsal and subdorsal vittæ on mesonotum concurrent with the median longitudinal lines and smooth lines over base of wings.

Gall (Pl. XXIII, fig. 3). Thin, flat, disc-shaped galls from leaves (presumably) of *Quercus douglasi*, about 6 mm. in diameter, greenish gray with lilac center, the margin irregular; upper surface a trifle wrinkled but otherwise smooth.

Habitat. Stanford University, Cal. (R. W. Patterson.)

Andricus wiltzæ n. sp.

Female. Head and thorax black, abdomen walnut brown, darker (almost black) on the dorsum, antennæ brown, 1st, 3rd and 4th segments spotted with black, distally from 6th segment fuscous to black, tegulae, sheath of ovipositor, anterior legs and joints of middle and hind legs brown. Head broad and thin, with close, reticular sculpturing, eyes narrow, antennæ 13-segmented, 1st and 2nd segments stout, 1st obconic, 2nd subglobular, 3rd longest, as long as 1 and 2 together, following segments progressively shorter to last, which is twice penultimate. Prothorax narrow in the middle and transversely folded, sparsely punctate, each puncture bearing a hair, mesonotum openly reticulate, transversely folded, parapsidal grooves complete and distinct, median longitudinal lines reaching almost half-way to posterior margin, smooth lines over base of wings distinct, pleura smooth and polished, aciculate in the middle, pubescent below, scutellum deeply rugose, basal foveæ large, oval, with smooth, shining bottom, approximate, separated only by a carina, metanotum smooth, polished, pubescent. Abdomen stout, subglobose, smooth and shining, 2nd segment occupying less than one-half its length, 3rd segment rather broad, slightly punctate, 4th, 5th and 6th segments narrow, all with oblique margins, ventral valve concealed, black, ovipositor sheath slightly projecting, pubescent. Wings hyaline, pubescent, subcostal, basal and radial veins heavy, brown, others faint, radial cell long, narrow, open at the margin, vein at base arcuate, areolet distinct but veins on two sides faint, cubitus faint, not reaching basal vein. Length 2.5 mm.

Gall. Polythalamous galls formed in the buds of *Quercus lobata*, distinguished by the thickly compacted cluster of aborted leaves.

Habitat. Stanford University, Cal. (Miss Bertha Wiltz.)

Andricus brunneus n. sp.

Female. Brown to reddish brown, the eyes, ocelli, tips of mandibles, antennæ distally, metanotum in the middle, tips of tarsi, abdomen dorsally at apex and dorsal valve black or blackish. Head faintly reticulate, face pubescent antennæ 14-segmented, 1st segment obconic, 2nd oval, 3rd longest, as long as 1 and 2 together and a little longer than 4th, succeeding segments to 9th progressively shorter, 9th and following segments subequal, except the last, which is a little longer than penultimate. Pronotum and mesonotum finely reticulate, sparsely punctate, each puncture bearing a hair, parapsidal grooves indistinct, reaching but half-way to anterior margin and rather widely separated, median longitudinal lines extending half-way to posterior margin, smooth lines over base of wings distinct and long, pleura smooth, microscopically reticulate, pubescent above and below, scutellum rugose, basally with large, transverse foveæ, smooth at bottom, contiguous, separated only by a carina, metanotum almost smooth. Abdomen smooth, shining, compressed and dorsally ridged, 2nd segment occupying not more than one-third its length, pubescent at the base, 3rd, 4th, 5th and 6th segments punctate, 7th segment reticulate, dorsal valve and sheaths of ovipositor

exserted. Wings hyaline, pubescent, subcostal, basal and vein at base of radial cell heavy, brown, others faint, radial cell long, open at margin, vein at base arcuate, with fuscous suffusion, areolet small but distinct, cubitus not reaching basal vein. Length 3 mm.

Gall. Thin-shelled, subglobular galls on leaves of *Quercus douglasi*, about the size of a pea, pointed at opposite poles.

Habitat. Stanford University, Cal. (R. W. Patterson.)

S *CALLIRHYTIS* Forst.

Callirhytis, A. Forster, Verh. Zool. Ges. Wien, vol. 19 Abh. (1869), p. 331, 335.

Andricus (*Callirhytis*), G. Mayr, Gen. d. Cynip. (1861), p. 27.

Differs from *Andricus* only in the following particulars: parapsidal grooves not always complete, tarsal claws simple.

Callirhytis chrysolepidicola (Ashm.)

Cynips chrysolepidicola, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 124.

Female. Brown, eyes, tips of mandibles, face above base of antennæ and on anterior margin, and metathoracic carinæ black, antennæ, abdomen dorsally, and tibiæ and tarsi of middle and hind legs fuscous. Head rugose, slightly pubescent, antennæ 15-segmented, 1st and 2nd segments stout, 1st obconic, 2nd smaller, 3rd segment longest, longer than 1 and 2 together, 4th-6th segments progressively shorter, following segments subequal except the last, which is smaller than penultimate. Mesothorax punctate and pubescent, parapsidal grooves indistinct, scutellum small, cushion-shaped, rugose and pubescent, foveæ distinct, oval, shallow and approximate. Abdomen darker than head or thorax, smooth and shining, 2nd segment pubescent at base, ventral and dorsal valves of medium length and pubescent, ovipositor long, extending much beyond the abdomen. Wings hyaline, pubescent, subcostal, radial basal and 2nd transverse veins heavy, black, other veins rather feeble, radial cell open at margin, areolet distinct. Length 2 mm.

Gall. Stem or twig galls; brown, with a bluish tint, and rugose, over 25 mm. long and about 15-20 mms. in diameter, the long axis lying in the direction of the twig, hard and woody, polythalamous.

Habitat. Pacific Grove, Cal. (C. P. Smith.) Pine Canyon, Cal. (Ashmead.)

Callirhytis apicalis (Ashm.)

Andricus apicalis, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 120.

Callirhytis apicalis, G. Mayr, Verh. Zool. Ges. Wien, vol. 52 (1902), p. 289.

"Galls. Irregular, brownish black, globular galls of a dense pithy substance, growing on the roots of *Quercus wisliceni*, sometimes three or four together, pressing each other into irregular shapes. Diameter usually about half an inch.

"Gall-fly. Female. Length 5.8 to 7 mm. Bright brick red, the mandibles black at tips. Head and thorax finely punctate with some larger, coarser punctures scattered over the surface, and almost free

from pubescence. Checks full, bulging. Antennæ 14-jointed, filiform, the 3rd joint slightly larger than 4th and narrowed toward base, the apical joint twice as long as the preceding, fusiform. Parapsidal grooves distinct, a more or less distinct medial groove and distinct grooved lines on the shoulders. Scutellum rugose, with two large foveæ at base, separated by a carina; pleura anteriorly slightly rugose, posteriorly nearly smooth, with some very delicate striæ. Abdomen smooth, with a few hairs on the side of second segment; the terminal segments show a fine, delicate punctuation; the spine of the ventral valve is long. Wings hyaline, except the entire apical third, which is smoky or dark brown, the veins stout, black, the angular projection in marginal cell at base being very distinct.

"Type. No. 3067, U. S. N. M.

"Three specimens, reared by Mr. Albert Koebele, from galls collected in Sacramento County, California, but the year of collecting and the date of rearing are not given. A single specimen (No. 3714) was reared February 17, 1886. The bright red color and smoky bases of wings will readily distinguish the species." (W. H. Ashmead).

I have not seen examples of this species.

Callirhytis quercus-pomiformis (Bass.)

Cynips quercus pomiformis, H. F. Bassett, Can. Ent., vol. 13 (1881) p. 74.

Andricus pomiformis, Ashmead, Tr. Am. Ent. Soc., vol. 12 (1885), p. 295.

Callirhytis pomiformis, G. Mayr, Verh. Zool. Ges. Wien, vol. 52 (1902), p. 289.

Callirhytis quercus-pomiformis, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidæ (1910), p. 568.

Female. Black, antennæ, legs, mandibles and abdomen ventrally dark brown. Head coarsely rugose, antennæ 14-15 segmented, 1st and 2nd segments stout, 3rd segment longest, a little longer than 4th, succeeding segments to 9th progressively shorter, 9th and following segments subequal, 15th a mere tip on preceding segment. Thorax coarsely rugose, parapsidal grooves distinct, complete, median longitudinal lines reaching half-way to posterior margin, scutellum rugose, with subcircular basal foveæ shallow, smooth and shining at bottom, not exactly approximate. Abdomen more or less smooth and shining, 2nd segment occupying about two-thirds its length, ventral valve and sheath of ovipositor pubescent. Legs clothed with pubescence. Wings hyaline, radial cell open at the margin, a black cloud at base, subcostal vein scarcely reaching margin, vein at base of radial cell angulate, areolet distinct, cubitus not always reaching basal vein. Length 3 mm.

Gall. Yellowish, subspherical galls, about 35 mm. in diameter, the surface more or less roughened by slight elevations in the form of longitudinal ridges, containing within numerous oval larval cells imbedded in the pithy substance of the gall.

Habitat. Stanford University, Cal. (R. W. Patterson.)

***Callirhytis quercus-agrifoliae* (Bass.)**

Cynips quercus agrifoliae, H. F. Bassett, Can. Ent. vol. 13 (1881), p. 53.

Andricus (*Callirhytis*) *agrifoliae*, G. Mayr, Gen. d. Cynip. (1881), p. 28.

Callirhytis quercus-agrifoliae, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidae (1910), p. 567.

Female. Pale yellowish brown, the antennæ distally from 10th segment and abdomen dorsally fuscous to black, eyes, ocelli, tips of mandibles, prosternum, metathorax, tips of tarsi and ventral valve black. Head faintly rugose, almost granulate, face pubescent, antennæ 14-segmented, filiform, 1st and 2nd segments stout, 1st obconic, 2nd oval, 3rd segment longest, as long as 1 and 2 together and a little longer than 4th, succeeding segments to 9th progressively shorter, 9th-13th subequal, last segment longer than penultimate by a half. Thorax elevated, subspherical, pronotum narrow in the middle, granulate, slightly pubescent, mesonotum reticulate, almost shagreened, parapsidal grooves deeply impressed, not quite complete but approaching anterior margin, median longitudinal lines reaching half-way to posterior margin, smooth lines over base of wings long and very distinct, pleura largely granulate, slightly pubescent above and beneath, aciculate in the middle, scutellum granulate, pubescent, basal foveæ large, oval, transverse, and shallow, with smooth, shining bottom, approximate, metathorax shallowly punctate, pubescent. Abdomen long oval, smooth and shining, 2nd segment occupying about half its length, 3rd and 4th segments rather wide, succeeding segments narrow, posterior margins in all oblique, ovipositor sheath exerted, pubescent. Wings hyaline, pubescent, veins pale brown, radial cell long, narrow, open at the margin, vein at base angulate, areolet distinct, cubitus not reaching basal vein. Length 3.5 mm.

Gall. Moderately large, brownish, hard, globular galls, about 10 mms. in diameter, on twigs of *Quercus agrifolia*, surface microscopically pubescent. Internally composed of a dense, cork-like substance, in which the single larval cell is imbedded.

Habitat. Palo Alto, Cal. (R. W. Patterson.)

***Callirhytis lasia* Ashm.**

Callirhytis lasius, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 132.

Female. Pale brownish yellow, legs lighter than body, abdomen dorsally darker, head and thorax pubescent. Head faintly rugose, antennæ 14-segmented, 1st segments obconic, 2nd long oval, 3rd segment longest, as long as 1 and 2 together and incised proximally for two-thirds its length, succeeding segments to 9th progressively shorter, 9th and following segments, which are fuscous, subequal, except last, which is longer than penultimate. Thorax closely punctate, punctation rather coarse, parapsidal and median grooves from posterior margin distinct, the former almost complete, median longitudinal lines reaching nearly half-way to posterior margin, smooth lines over base of wings rather long, scutellum flat, closely punctate, basal foveæ transverse and not separated by a carina. Abdomen smooth and shining, 2nd segment occupying less than half its length, pubescent at base, 3rd, 4th and 5th

tergites visible, dorsal and ventral valves with a brush of hairs. Wings hyaline, pubescent, veins fairly distinct, radial cell open at margin, short, vein at base arcuate, radius only slightly bent, almost a straight line, areolet present and distinct, cubitus not reaching basal vein. Length 2 mm.

Gall. Brownish, subglobular, depressed galls on under side of leaves of *Quercus chrysolepis*, 6-7 mm. in diameter, punctate, and covered with pubescence, which is pale brownish tinged with red. Polythalamous.

Habitat. Stevens Creek Canyon, above Cupertino, Cal. (R. W. Patterson.)

Callirhytis quercus-suttoni (Bass.)

Cynips quercus suttoni, H. F. Bassett, Can. Ent., vol. 13 (1881), p. 54.

Andricus (*Callirhytis*) *suttoni*, G. Mayr, Gen. d. Cynip. (1881), p. 28.

Callirhytis quercus-suttoni, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidæ (1910), p. 564.

Callirhytis polythra, Beutenmüller in litt.

Female. Reddish brown, tips of mandibles, oral margin, antennæ distally from 4th segment at joints, prosternum, base of scutellum, metathorax, abdomen dorsally at base, ventral valve and hind tibiae and tarsi black or blackish. Head faintly rugose, face pubescent, eyes narrow, antennæ 15-segmented, filiform, 1st and 2nd segments stout, 3rd segment longest, longer than 1 and 2 together and one-half longer than 4th, succeeding segments to 9th progressively shorter, 9th-15th subequal. Pronotum narrow in the middle, mesonotum coriaceous and sparsely punctate, pubescent, parapsidal and median grooves reaching less than half-way to anterior margin, median longitudinal lines and smooth lines over base of wings distinct, pleura pubescent, medially smooth and bare, scutellum rugose and pubescent, a rather broad, arcuate groove at base in place of the usual foveæ. Abdomen smooth and shining, second segment occupying less than half its length, pubescent at base, 3rd and 4th segments rather broad, succeeding segments narrow or concealed, ventral valve prominent, ovipositor sheath exerted, pubescent. Legs thickly covered with short hairs. Wings hyaline, pubescent, veins brownish, rather faint, radial cell long, narrow, open at the margin, vein at base angulate, areolet distinct, cubitus not reaching basal vein. Length 3.5 mm.

Gall. Spherical or elongate twig swelling on *Quercus agrifolia*, and *Quercus chrysolepis*, about 20-30 mms. in length and 15-25 mms. in diameter, covered with normal bark and lignous within. Polythalamous, the numerous oval cells lying near the surface.

Habitat. Claremont, Cal. (Baker.)

Callirhytis vacciniifoliæ Ashm.

Callirhytis vacciniifoliæ, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 130.

"Gall. A thin shelled, globular gall, with a central kernel held in place by radiating filaments and closely resembling the gall produced

by *A. inanis* Osten-Sacken, but the average size is smaller and the color of the gall darker. It measures from half an inch to a little over an inch in diameter and is found on *Quercus vaccinifolia* in California.

"Gall-fly. Female. Length, 2 to 3.2 mm. Red or brownish red (one specimen has the thorax almost black), antennæ and legs brownish yellow, sometimes obfuscated; several terminal joints of the antennæ are dark brown. Head closely punctate; thorax almost smooth, the parapsidal grooves sharply defined, complete, a short median groove posteriorly and the groove on the shoulder indistinct; scutellum rugose, the foveæ large, broad, distinct, and separated only by a carina; mesopleura smooth, polished, the triangular piece beneath tegulæ alone being punctate. The abdomen is longer than the head and thorax together, the segments oblique, the second segment occupies about two-thirds of the whole surface and is a little pubescent at sides near the base, impunctate, some of the short terminal segments a little dusky; spine of ventral valve rather long, hairy. Wings hyaline, pubescent, the veins pale brown; the vein at base of marginal cell is slightly bent, but not angulate, the marginal cell being very long and narrow, areolet distinct, but the surrounding veins delicate, cubital cell almost closed.

"One of the specimens is but 2 mm. long and of a uniform brownish yellow color, but structurally it does not seem to differ from the others.

"Type No. 3087, U. S. N. M.

"Four specimens, reared October 16, and December 4, 1884, from galls collected by Prof. J. H. Comstock, at Truckee, California, on *Quercus vaccinifolia*." (W. H. Ashmead).

I have not seen examples of this species.

Callirhytis maculipennis Kieff.

Callirhytis maculipennis, Kieffer, Bull. Soc. Metz, ser. 2, vol. 11 (1904), p. 131.

Callirhytis maculipennis, Kieffer, Invert. Pacif., vol. 1 (1904), p. 42.

"Black, opaque and pubescent. Head rugose, enlarged behind the eyes; front coriaceous, temples longitudinally striated and finely punctured, nearly smooth and shining close behind the eyes. Antennæ brownish-red, the last joints more or less fuscous, 14-jointed, nearly glabrous; second joint hardly longer than thick; the third at least thrice as long as thick, the following joints gradually decreasing in size; joints 9-13 nearly equal, one third longer than thick; the last a little longer than the penultimate. Thorax coarsely rugose; mesonotum irregularly rugose posteriorly between the parapsidal furrows, anteriorly and laterally more or less transversely rugulose; parapsidal furrows complete; the four glabrous lines of the mesonotum are rigid; mesopleura shagreened and smooth; scutellum hardly longer than wide, rugose, with two triangular foveæ at the base and a longitudinal middle furrow in the anterior two-thirds. Metanotum glabrous, shagreened, with three longitudinal carinæ, the lateral ones curved outwards. Wings hyaline, fringed, with a fuscous spot at the base of the radial cell; first abscissa of the radius angulate. Legs brownish red, hind femora and middle part of the hind tibiæ fuscous; claws simple. Abdo-

men smooth, shining, laterally pubescent only at the base of the second segment, longer than the head and the thorax united; second segment one-fourth shorter than the whole abdomen, finely punctulate apically, laterally very sloping; the two following segments also punctulate. Length of female 3.5-4 mm.

"Gall. A bud gall on *Quercus agrifolia*, globular, the diameter 22 mm. or more, whitish, smooth and glabrous, apically with a very small wart; the inner substance is also whitish, somewhat spongiose, and contains below the middle several brownish cells which are 4 mm. high and 2 mm. wide.

"This species is allied to the genus *Amphibolips*, from which it is excluded by the tarsal claws being simple." (J. J. Kieffer).

I have examined an example of both gall and gallfly of *C. maculipennis*, kindly furnished by Mr. Baker.

Callirhytis eriophora Kieff.

Callirhytis eriophora, Kieffer, Bull. Soc. Metz, ser. 2, vol. 11 (1904), p. 132.
Callirhytis eriophora, Kieffer, Invert. Pacif., vol. 1 (1904), p. 43.

"Brownish red, opaque, scarcely pubescent, and finely shagreened. Head enlarged behind the eyes. Antennæ 14-jointed, the second joint longer than thick; the third fully thrice as long as thick, scarcely longer than the fourth; the following joints gradually shorter and thicker; the penultimate, one-third longer than thick, shorter than last. Mesonotum nearly glabrous, with four dusky longitudinal stripes, the lateral of which are abbreviated anteriorly, the two others shortened posteriorly; parapsidal furrows not complete, anteriorly obliterated. Scutellum rugose, nearly glabrous, basally with two divergent foveæ. Metanotum black-brown, with two parallel carinæ. Wings hyaline, fringed, the veins brown, the first abscissa of radius angulated. Legs faint yellow; claws simple. Abdomen dark red-brown, above nearly black; the second segment occupying nearly the whole abdomen, very shining, glabrous, posteriorly microscopically punctulate; ventral-spine eight times as long as wide. Length of the female 3-3.2 mm.

"Gall. A bud gall on *Quercus wislizenii*; the gall is rounded, 10 mm. in diameter, the outer portion a yellowish wool-like substance, the inner a globular, ligneous, thin-shelled and monothalamous cell, 4 mm. or more in diameter." (J. J. Kieffer).

I have seen examples of this species, kindly furnished by Mr. Baker.

Callirhytis clarimontis Kieff.

Callirhytis clarimontis, Kieffer, Bull. Soc. Metz, ser. 2, vol. 11 (1904), p. 132.
Callirhytis clarimontis, Kieffer, Invert. Pacif., vol. 1 (1904), p. 43.

"Brownish yellow, finely shagreened and scarcely shining. Head enlarged behind the eyes. Antennæ black-brown apically, 14-jointed; the third joint nearly five times as long as thick, one half longer than the fourth; the following joints gradually decreasing in length, the penultimate one-third longer than thick, the last more than twice as

long as thick. Mesonotum nearly glabrous, with four dusky longitudinal stripes, the two lateral ones abbreviated anteriorly; the parapsidal furrows complete. Scutellum rugose, nearly glabrous, with two divergent foveæ at the base. Metanotum black-brown, with two parallel carinæ. Wings hyaline, fringed, the veins dusky, the first abscissa of the radius angulated. Legs and coxæ faint yellow, claws simple. Abdomen glabrous, highly polished, not punctulate, dorsally more or less black-brown, the second segment surpassing somewhat the middle, laterally very sloping; ventral-spine four to five times as long as wide. Length of the female 3.5-4 mm.

"Gall. The gall of this species was found on *Quercus agrifolia*; it is a bud gall 8 mm. in diameter and more, globular, opaque, yellowish, with some sparse brown spots, glabrous, apically with short and sparse hairs and a small wart; the inner substance is brown, spongiöse, and encloses a globular, faint yellow, thick-shelled, monothalamous shell 5 mm. in diameter and more; wall of the cell 1.6 mm. thick." (J.J.Kieffer)

I have seen examples of this species, kindly furnished by Mr. Baker.

Callirhytis bakeri Kieff.

Callirhytis bakeri, Kieffer, Bull. Soc. Metz, ser. 2, vol. 11 (1904), p. 132.

Callirhytis bakeri, Kieffer, Invert. Pacif., vol. 1 (1904), p. 44.

"Brown-red, shagreened and pubescent. Head enlarged behind the eyes. Antennæ sometimes black-brown apically, 14-jointed; the second joint longer than thick; the third joint four times as long as thick, one-third longer than the fourth; joints 4-6 subequal, the fourth scarcely longer than the fifth, the eight apical joints gradually decreasing in length, the penultimate one-half longer than thick, a little shorter than the last, or sometimes only half the length of the last. Thorax scarcely shining; parapsidal furrows obliterated anteriorly; scutellum rugose, the two basal foveæ black, deep, separated by a small carina and oblique and divergent; postscutellum and metanotum rugose, the two carinæ parallel. Wings hyaline, fringed, veins brown, first abscissa of the radius angulated. Legs and coxæ faint yellow, claws simple. Abdomen black-brown, highly polished and shining, glabrous, longer than the head and the thorax united, the second segment with a pubescent spot on either side at base; these spots occupy the basal three-fourths, the segments are microscopically punctured apically; ventral-spine four times as long as wide. Length of the female 3.8-4 mm.

"Gall. A bud gall on *Quercus crassipocula* [*chrysolepis*]; gall oval, about 13 mm. high and 11 mm. thick, smooth, glabrous, ligneous, apically with a thin, longitudinally striated, thick and more or less bent point which is about 8 mm. high and 1.5 mm. thick; proximally with some bud-scales lying close to the base of the gall; the inner substance subspongiöse." (J. J. Kieffer).

I have seen examples of this species, kindly furnished by Mr. Baker.

***Callirhytis rossi* Kieff.**

Callirhytis rossi, Kieffer, Marcellia, vol. 2 (1903), p. 84.

“Forme Agame. Noir; mandibules, les sept premiers articles antennaires, pattes antérieures, tibias et tarses des pattes intermédiaires, et écailles ferrugineux; scape plus ou moins noirâtre; toutes les hanches noires; fémurs intermédiaires et postérieurs, tibias et tarses des pattes postérieures d'un brun noir. Abdomen d'un brun marron, dessus noir en partie. Vertex avec des rides irrégulières et grossières; face avec des stries rayonnant de la bouche jusqu'au bord des yeux; joues égalant la moitié de la longueur de ces derniers. Mandibules bidentées, aussi larges que longues. Palpes maxillaires composés de quatre articles, dont le premier dépasse de moitié la longueur du second; celui-ci à peine plus long que le troisième, trois fois aussi long que gros; le dernier un peu plus long que le premier et distinctement plus gros. Palpes labiaux composés de trois articles dont le second n'est pas plus long que gros; le premier cylindrique, presque trois fois aussi long que gros; le troisième plus gros que les autres, un peu aminci aux deux bouts, avec une petite nodosité à l'extrémité, deux fois aussi long que gros, à peu près aussi long que le premier. Antennes à peine plus épaisses vers l'extrémité, composées de 14 articles, dont le second est deux fois aussi long que gros; le troisième quatre fois aussi long que gros, un peu plus long que le quatrième; les suivants diminuant graduellement; le douzième et le treizième à peine plus longs que gros, le quatorzième double du treizième. Thorax mat, à peine pubescent; mésopleures avec une tache brillants et lisse; partie inférieure des propleures ridée régulièrement et longitudinalement; pronotum, mesonotum, scutellum et segment médiaire ridés grossièrement et irrégulièrement; sillons parapsidaux percurrents, entre eux se voient deux arêtes parallèles situées dans le tiers antérieur du mesonotum; côtés du mesonotum avec un sillon longitudinal bien apparent. Fossettes du scutellum profondes, très rapprochées à leur base. Segment médiaire avec deux arêtes faiblement convergentes et circonscrivant une aire traversée par une arête en forme de T; côtés du segment médiaire avec une dent distincte. Crochets des tarses simples, à peine aussi longs que la palette. Ailes antérieures faiblement enfumées dans leur tiers apical, avec une tache d'un brun marron à l'angle basal interne de la même cellule; nervure sous-scostale marquée de brun noir à l'endroit de l'insertion de la basale; bord cilié; cellule radiale peu longue, ouverte à la marge, largement aussi à la base et faiblement au sommet; première partie du radius arquée, au moins aussi longue que la partie apicale de la sous-costale; aréole distincte; nervures d'un brun clair, base du cubitus peu marquée. Ailes inférieures hyalines, avec une nervure sous-costale, une basale s'étendant des crochets frénaux au bord postérieur et une médiane s'arrêtant à la basale. Abdomen avec une large tache de pubescence de chaque côté de sa base, avec sept segments distincts, aussi long que la tête et le thorax réunis; second segment occupant la moitié de la longueur de l'abdomen; bord postérieur des six premiers segments finement et

densément pointillé; après la mort, à moins que les insectes n'aient été tués dans l'alcool, le second segment atteint presque l'extrémité abdominale, et ne laisse à découvert qu'un mince bord des deux segments suivants. Spinule ventrale trois fois aussi longue que large. Taille ♀ 4 à 5 mm.

"Oeuf presque globuleux, un peu plus long que gros, atteignant la cinquième de la longueur de son pédicelle.

"Galle. On trouve la galle de cet insecte sur un Chêne à feuilles caduques et légèrement pubescent sur le dessous, à jeunes rameaux tomenteux de blanc. [*Quercus chrysolepis?*] Elle est formée aux dépens d'un bourgeon axillaire; comme celle de *Cynips toza* Bosc., elle chevauche sur le rameau qui, pour l'unique exemplaire que j'ai recu, était gros de 3 mm. Sa forme est sphérique, sa couleur d'un jaune brunâtre, son diamètre de 40 mm., sa surface couverte d'aspérités surtout dans la moitié supérieure; ces aspérités atteignent au maximum 1 mm. en hauteur et sont souvent confluentes de façon à former des carènes ou des rides irrégulières, longitudinales ou transversales. Au pôle supérieur, la galle se prolonge en une pointe conique, haute de 5 mm., large d'autant à sa base, ligneuse, et striée longitudinalement. L'intérieur est spongieux comme chez celle de *Cynips toza*, avec le centre ligneux; cette partie ligneuse et très dure, dont le diamètre mesure 18 mm., renferme de nombreuses cellules larvaires séparées l'une de l'autre par une paroi épaisse de 0.60 à 1 mm., longues de 3.5 à 4 mm. et larges de 2 mm. Chacune de ces cellules renferme une galle interne de même forme, étroitement appliquée au tissu environnant, mais d'un gris jaunâtre un peu plus clair, se détachant assez facilement et à paroi extrêmement mince et fragile. Ecllosion en mai de la seconde année. J'ai obtenu 19 Cynipides d'une seule galle.

"Patrie. Californie. L'unique exemplaire m'a été envoyé par M. le docteur Ross, à qui l'insecte est dédié." (J. J. Kieffer.)

I have not seen examples of this species.

Callirhytis nigra n. sp.

Female. Black, ocelli, antennæ, tegulæ, legs and ovipositor sheath brown. Head broad and thin, microscopically reticulate, face and cheeks pubescent, antennæ 13-segmented, incrassate at tip, 1st and 2nd segments stout, 2nd oval, about one-half of 1st, 3rd and 1st segments subequal, 4th-6th a little shorter, 7th and following segments shorter and subequal, except the last, which is twice as long as penultimate and a little longer than 3rd; all the segments more or less pubescent. Pronotum narrow in the middle, sides deeply punctate, each puncture bearing a hair, mesonotum coriaceous-reticulate, almost smooth and shining, parapsidal grooves distinct and complete, median longitudinal lines not reaching half-way to posterior margin, smooth lines over base of wings distinct, mesopleura smooth and shining, aciculate above, pubescent beneath, scutellum deeply rugose, basal foveæ oval, deep, with smooth, shining bottom, approximate. Abdomen smooth and shining, much compressed apically, 2nd segment occupying about half its length, its posterior margin oblique, 3rd and 4th segments nar-

row, ventral valve oblique and extending upwards to dorsal line, ovipositor sheath protruding slightly and pubescent. Legs covered with pubescence. Wings hyaline, pubescent, veins faint, brownish, radial cell long, open at the margin, vein at base arcuate, arcolet and cubitus indistinct. Length 1.75 mm.

Gall. An irregular swelling or enlargement of the terminal twigs of *Quercus lobata*, subglobular, 15 mm. x 12 mm., apparently monothalamous.

Habitat. San Jose, Cal. (R. W. Patterson.)

Callirhytis guadaloupenis n. sp.

Female. Yellowish brown to reddish brown, one specimen with the head, pronotum, median stripe on mesonotum, scutellum, metanotum and abdomen darker; tips of mandibles, ocelli, basal region of antennæ, pecten, tibiæ, tarsi and caudal aspect of femora black or blackish. Head closely punctate, pubescent, antennæ 14-segmented, 1st and 2nd segments stout, 3rd segment long, longer than 1 and 2 together, 4th to 8th segments progressively shorter, following segments subequal, except last, which is twice penultimate. Thorax rugose and partially pubescent, parapsidal grooves on mesonotum reaching half-way to anterior margin, median longitudinal lines and smooth lines over base of wings distinct, the former extending less than half-way to posterior margin, scutellum pointed, deeply rugose and pubescent, basal foveæ inconspicuous, pleura rugose and pubescent. Abdomen smooth, six tergites visible, the second occupying less than one-third the entire length, pubescent at base, dorsal and ventral valves pubescent, tips with tufts of hair. Wings small and narrow, veins heavy, outer third of cubitus not reaching margin, the basal portion of which is hairy, arcolet distinct, basal third of cubitus not reaching basal vein. Length 2.5 mm.

Gall (Pl. XXIII, fig. 4). Hard, smooth, flat, disc-shaped galls on under side of leaves of *Quercus chrysolepis*, 5-6 mm. in diameter apparently monothalamous.

Habitat. Guadalupe, Cal. (R. W. Patterson.)

Callirhytis sanctæ-claræ n. sp.

Female. Reddish brown, eyes, tips of mandibles and ocelli black, legs yellowish brown. Head faintly rugoso-punctate, pubescent, antennæ 14-segmented, 1st and 2nd segments stout, 3rd segment long, a little longer than 1 and 2 together, succeeding segments to 9th progressively shorter, 9th and following segments subequal, except the last, which is a little longer than penultimate. Thorax rugoso-punctate, parapsidal grooves on mesonotum distinct, extending half-way to anterior margin, median longitudinal lines reaching half-way to posterior margin, smooth lines over base of wings distinct, mesopleura almost bare, upper portion closely and finely punctate, lower portion aciculate, scutellum rugoso-punctate, basal foveæ large, shallow, with smooth, shining bottom, approximate, separated only by a carina,

metanotum pubescent. Abdomen smooth, shining, very much compressed, 2nd segment occupying more than two-thirds its length, posterior margin finely punctate, ventral valve conspicuous, paler than the rest of the abdomen, dorsal valve darker and pubescent, ovipositor sheath conspicuously exerted. Wings hyaline, pubescent, veins distinct, yellowish, radial cell open at the margin, vein at base arcuate, almost angulate, areolet distinct, cubitus not reaching basal vein. Length 3-3.5 mm.

Gall (Pl. XXIII, fig. 5). Acorn galls at the tip of leafy twigs of *Quercus chrysolepis*. 15 mms. long, and double, the basal portion smaller, and telescoped in the upper portion; rugose and covered with a whitish bloom. Monothalamous.

Habitat. Stevens Creek Canyon, above Cupertino, Cal. (R. W. Patterson.)

9 SYNERGUS Hartig.

Synergus (part.), T. Hartig, Zeits. f. Ent., vol. 2 (1840), p. 186, 197.

Face radiately striated, clypeus imperceptible or nearly so, subdorsal frontal grooves always present, usually long. Antennæ 13-15 segmented in female, 14-15 segmented in male, distally from 3rd segment in female filiform, in male often thickened, 3rd segment often strongly emarginate basally and distally more or less thick. Mesonotum shagreened, very often transversely wrinkled, parapsidal grooves complete, scutellum with basal foveæ. Abdomen compressed, 1st segment or petiole longitudinally striate, tergite of the 2nd segment greatly enlarged and covering the greater part of the abdomen, or in the male obscuring it, 2nd and 3rd tergites joined without suture and enclosing following segments. Radial cell closed, short. Claws bidentate. Ventral valve short. Inquilines in galls on *Quercus*.

Synergus agrifoliae Ashm.

Synergus agrifoliae, Ashmead, Tr. Am. Ent. Soc., vol. 23 (1896), p. 189.

"Female. Length 2-2.4 mm. Brownish yellow, the legs and coxæ paler, the metathorax dusky; ocelli, eyes and mandibles black, or brown-black. The face and pleura are finely striated, head and thorax finely minutely rugose, pubescent, the parapsidal furrows wanting, the foveæ of scutellum small, shallow, hardly apparent; antennæ 13-jointed, flagellar joints 2 and 3 equal, little shorter than the first. The abdomen is not quite as long as the head and thorax combined, slightly compressed, and vertically it is almost as wide as long with the tips sometimes dusky. Wings hyaline, pubescent, the veins pale or hyaline, the areolet distinct, but the closing vein very delicate; in two specimens it is absent.

"The male is but 1.5 mm. long, and, excepting the black eyes and ocelli, entirely brownish yellow.

"Habitat. Los Angeles, California.

"Described from thirteen specimens, bred by Mr. Albert Koebele, from a gall not unlike *Neuroterus saltatorius* Edw., occurring on *Quercus agrifolia*." (W. H. Ashmead).

I have not seen examples of this species.

Synergus brevicornis Ashm.

Synergus brevicornis, Ashmead, Tr. Am. Ent. Soc., vol. 23 (1896), p. 189.

"Female. Length 2.8-3 mm. Stature similar to *S. leviventris*. but the sculpture of the thorax is more rugose, the abdomen proportionately shorter, the ventral valve projects slightly, and the antennæ reach back only two-thirds the length of thorax. Vertex of head, thorax and abdomen black; orbits, cheeks, face, antennæ and legs, brownish yellow, the depth of color often varying; middle and posterior coxæ black, the front pair often dusky basally, posterior femora often more or less clouded; antennæ 13-jointed, filiform, the 3rd joint one-third longer than 4th; face and mesopleura rather coarsely striated; scutellum rounded, depressed at base with two distinct foveæ; the grooves of the mesonotum rounded, almost obsolete by the coarse sculpture. Abdomen highly polished, the second segment entirely hiding all the others and gaping open at apex, in consequence the ventral valve projects, is brownish and armed with a slight spine. Wings hyaline, pubescent, the veins pale, the submarginal and marginal veins brownish apically; arcolet large, closed, the cubital cell only partially closed.

"The male is but 1.8 mm. long, with the head wholly, except stemmaticum, and the legs, including coxæ, brownish yellow. The antennæ are short, 15-jointed, the 3rd joint long, strongly excised, the apical joint brown.

"Habitat. Eldorado County, California." (W. H. Ashmead).

I have not seen examples of this species.

Synergus flavus Kieff.

Synergus flavus, Kieffer, Bull. Soc. Metz, ser. 2, vol. 11 (1904), p. 133.

Synergus flavus, Kieffer, Invert. Pacif., vol. 1 (1904), p. 45.

"Pale yellow or reddish yellow; head distinctly broader than the thorax, without carinæ; front and vertex smooth, face and cheeks paler yellow. Antennæ of the male 15-jointed, the two to three last joints more dusky; second joint longer than thick; the third scarcely longer than the fourth, faintly emargined outwardly; the fourth twice as long as thick; the following ones gradually becoming shorter; the penultimate joint is a little longer than thick, shorter than the last and all are very slender; antennæ of the female 14-jointed, filiform and slender; the third joint fully thrice as long as thick, the following gradually decreasing in size, the penultimate only one-third longer than thick, shorter than the last. Mesonotum finely coriaceous; mesopleura very finely longitudinally striated; scutellum brownish red, rugose, the usual foveæ small, not very distinct, separated by a small carina. Metanotum brown or black-brown, the carinæ parallel. Wings hyaline, veins brownish. Tarsal claws simple. Petiole of abdomen black, coarsely longitudinally striated; the second segment reaching to the apex of the abdomen, smooth and not punctured.

"Bred from galls of *Callirhytis maculipennis*; the guests live in the spongy substance of the gall, outside of the cells, and do not hinder the development of the gall makers." (J. J. Kieffer).

I have seen examples of this species, kindly furnished by Mr. Baker.

Synergus dimorphus O.-S.

Synergus dimorphus, Osten-Sacken, Proc. Ent. Soc. Philad., vol. 4 (1865), p. 376.

Synergus dimorphus, Gillette, Tr. Am. Ent. Soc., vol. 23 (1896), p. 86, 87.

Female. Black, antennæ, ocelli, face on anterior margin, mandibles basally, genæ and orbital margins, tegulæ, legs (except coxæ) and ovipositor sheath yellowish brown, tips of antennæ and tarsi fuscous. Head faintly reticulate, face radiately striate, antennæ 14-segmented, 1st segment stout, 2nd slender and oval, 3rd longest, slightly longer than either 4 and 5, following segments progressively shorter, except the last, which is somewhat longer than penultimate. Pronotum wide in the middle, rugose, mesonotum transversely wrinkled (some specimens without transverse folds, rugose), parapsidal grooves incomplete, extending less than half-way to anterior margin, median longitudinal lines not reaching the middle, smooth lines over base of wings distinct, mesopleura transversely aciculate, with a triangular smooth patch beneath wing, scutellum deeply rugose, foveæ indistinct, small, oval and approximate, separated by a median carina; pronotum, mesonotum and scutellum sparsely covered with silvery pubescence. Abdomen smooth and shining, vertical and horizontal dimensions almost equal, tergal line from the side almost straight, sternal line semicircular, 2nd tergite wholly obscuring the following segments, posterior margin faintly punctate. Wings hyaline, pubescent, radial, subcostal, basal and 2nd transverse veins black, heavy, others faint, radial cell short, closed, vein at base slightly arcuate, areolet indistinct, cubitus not reaching basal vein. Length 2.25-2.5 mms.

Male. Black, tips of mandibles, palpi, antennæ (except distally infuscated basal segments), legs (except trochanters and coxæ), ventral margin of abdomen and a transverse basal band brown. Head rugose and finely reticulate, antennæ 15-segmented, reaching middle of abdomen, 3rd and 4th segments subequal, 3rd longer than 1 and 2 together, incised at base, following segments progressively shorter to last. Thorax coarsely rugose, mesonotum transversely wrinkled, parapsidal grooves complete and deeply impressed, median longitudinal lines distinct, posterior margin of abdomen punctate. Wings hyaline, pubescent, areolet distinct, cubitus nearly reaching basal vein. Length 3.5 mm.

Bred from galls of *Cynips multipunctata* on *Quercus lobata*.

Habitat. Stevens Creek Canyon, above Cupertino, Cal. (R. W. Patterson.)

***Synergus oneratus oneratus* (W. Harr.)**

Cynips oneratus, T. W. Harris, Treat. Ins. N. Eng. (1842), p. 398.

Synergus oneratus, B. D. Walsh, Proc. Ent. Soc. Philad., vol. 2 (1864), p. 488, 498.

Synergus oneratus oneratus, Dalla Torre and Kieffer, Das Tierreich, lief. 24 Cynipidae (1910), p. 632.

Female. Yellowish brown, legs and face light yellowish brown, eyes, ocelli, tips of mandibles, prosternum, pecten, mesopleura beneath, metathorax apically and hind tarsi black; pubescent. Head faintly

rugose and sparsely punctate, punctation in the form of irregularly scattered shallow pits, face pubescent, radiately striate, antennæ 14-segmented, 1st segment large, 2nd subglobular, 3rd and 4th segments subequal, as long as 1 and 2 together, 5th and succeeding segments to 11th progressively shorter, 11th to 14th subequal. Pronotum wide in the middle, rugose, mesonotum transversely wrinkled, parapsidal grooves distinct, extending half-way to anterior margin, median longitudinal lines not reaching the middle, mesopleura coarsely aciculate, with a triangular smooth patch beneath wings, scutellum coarsely rugose, almost coarsely reticulate, basal foveæ transversely elongate, shallow, smooth and shining at bottom, approximate, metanotum rugose. Abdomen smooth and shining, 2nd tergite completely obscuring the following segments, posterior margin microscopically punctate, apex dorsally black, dorsal valve prominent, pubescent, ovipositor protruding. Wings hyaline, pubescent, a few of the veins heavy and black, the others faint, radial cell closed, very short, vein at base not much curved, areolet small and indistinct, veins enclosing it almost obliterated, cubitus not reaching basal vein and very faint. Length 2-3 mm.

Male. Black, antennæ, face beneath antennæ and around eyes, ocelli, tegulae, coxæ, trochanters, femora, tibiæ largely, and abdomen on posterior margin brownish or pale brown; sparsely pubescent. Head reticulate, faintly punctate, face radiately striate, antennæ 15-segmented, all the segments conspicuously grooved or channeled, 3rd and 4th segments subequal, longer than 1 and 2 together, succeeding segments to 11th progressively shorter, 11th and following segments subequal. Thorax coarsely rugose, mesonotum transversely ridged, parapsidal grooves indistinct, almost wholly obliterated by the coarseness of sculpture, pleura coarsely aciculate, small median patch smooth, scutellum coarsely rugose, almost coarsely reticulate, smooth and shining beneath rugæ, foveæ large, oval and shallow, with smooth bottoms, separated only by a carina, metanotum rugose. Abdomen smooth and shining, 2nd tergite completely obscuring following segments, posterior margin microscopically punctate. Wings hyaline, pubescent, costal, subcostal, radial and basal veins heavy, black, others faint, radial cell closed, areolet small, indistinct, cubital vein faint and not reaching basal, vein at base of radial cell almost straight. Length 1.5-2 mm.

Bred from galls of *Holocaspis eldoradensis* on *Quercus lobata*.

Habitat. Jasper Ridge, near Stanford University, Cal.
(R. W. Patterson.)

Synergus punctatus Gillette.

Synergus punctatus, Gillette, Tr. Am. Ent. Soc., vol. 23 (1896), p. 90, 94.

Female. Black, the ocelli, face anteriorly, antennæ, tegulae, pedicel, abdomen anteriorly and posteriorly and legs brown; sparsely pubescent. Head faintly reticulate, shining, face radiately striate, antennæ 14-segmented, 1st and 2nd segments stout, 3rd long, about as long as 1 and 2 together and longer than 4th, succeeding segments to 10th progressively

shorter, 10th and following segments subequal, except last, which is longer than the penultimate, all longitudinally grooved or channeled and pubescent. Pronotum broad in the middle, rugose, mesonotum transversely wrinkled, folds rather shallow, parapsidal grooves reaching less than half-way to anterior margin, median longitudinal lines and smooth lines over base of wings distinct, mesopleura aciculate, triangular patch beneath wings smooth and shining, scutellum deeply rugose, foveæ large, circular shallow, metathorax almost smooth. Abdomen smooth and shining, 2nd tergite completely obscuring following segments, pubescent at base, posterior margin punctate, sheath of ovipositor conspicuous, pubescent. Wings hyaline, pubescent, veins basally heavy, black, radial cell closed, short, vein at base only slightly bent, areolet subobsolete, only one of its enclosing veins distinct, cubitus not reaching basal vein. Length 1.25 mm.

Bred from galls of *Holcaspis eldoradensis* on *Quercus lobata*.

Habitat. Jasper Ridge, near Stanford University, Cal.
(R. W. Patterson.)

Synergus ochreus n. sp.

Female. Brown, the legs and face light brown, eyes, ocelli, tips of mandibles, pecten, dorsal vitta on abdomen, ventral valve and tips of tarsi black. Head rugose, face radiately striate, subdorsal stripe from base of antennæ to ocelli and continued around eyes, antennæ 15-segmented, 1st segment stout, obovate, 2nd narrowly ovate, half the length of the 1st, 3rd-6th subequal, one-third longer than 1st, 7th-9th progressively shorter, 10th and following segments subequal. Pronotum wide in the middle, transversely rugose, pubescent, mesonotum transversely wrinkled or folded, parapsidal grooves complete, widely separated, obscured by transverse folds, a median longitudinal groove posteriorly reaches half-way to anterior margin, median longitudinal lines short, smooth lines over base of wings distinct, mesopleura transversely aciculate and shining, pubescent above and below, scutellum cushion-shaped, rounded posteriorly, faintly rugose and punctate, each puncture bearing a hair, basal foveæ large, circular or transversely oval and shallow, bottom punctate, shining, pubescent. Abdomen compressed, smooth and shining, 2nd tergite reaching apex and almost wholly obscuring following segments, faintly but broadly punctate on posterior margin, ventral valve reaching line of the tergum, black. Wings hyaline, pubescent, veins, excepting anal and cubital, heavy, brown, radial cell short, closed, vein at base slightly arcuate, areolet absent, veins on two sides and basal abscissa of cubitus scarcely visible. Length 3.5 mm.

Bred from galls of *Cynips multipunctata* on *Quercus lobata*.

Habitat. Stevens Creek Canyon, above Cupertino, Cal.
(R. W. Patterson.)

***Synergus niger* n. sp.**

Female. Black, antennæ, ocelli, tips of mandibles, tegulæ, legs (except hind coxæ basally), abdomen on ventral and posterior margin, and ovipositor brown, last segment of antennæ fuscous. Head broad, smooth and shining, microscopically reticulate, face radiately striate except in a circular smooth patch above mouth, antennæ 14-segmented, rather stout, 1st and 2nd segments stouter than those following, 3rd segment longest, longer than 4th but not as long as 1 and 2 together, following segments progressively shorter, except last, which is much longer than penultimate. Thorax smooth and shining, pronotum broad in the middle, microscopically coriaceous-reticulate, pubescent, mesonotum finely sculptured and punctate, each puncture bearing a hair, parapsidal grooves incomplete, reaching about the middle, median longitudinal groove coextensive, median longitudinal lines extending less than half-way to posterior margin, smooth lines over base of wings distinct, mesopleura smooth and shining, transversely aciculate in middle, pubescent beneath, scutellum deeply rugose, foveæ large, subcircular and shallow, with smooth, shining bottom, contiguous, separated by a carina, metanotum smooth, punctate and pubescent. Abdomen smooth and shining, 2nd tergite extending to apical margin and almost wholly obscuring the following segments, nearly as long as head and thorax together, but not wide, line of the tergum only slightly arcuate, ovipositor sheath exerted. Wings hyaline, pubescent, veins brown, only subcostal, radial and basal nervures distinct, radial cell closed, vein at base slightly arcuate, areolet indistinct or absent, cubitus indistinct. Length 1.75-2 mms.

Male. Differs in having 15-segmented antennæ and the head brown below base of antennæ, on cheeks and on orbital margin.

Bred from a bud gall on *Quercus lobata*.

Habitat. Stanford University, Cal. (R. W. Patterson.)

***Synergus splendidus* n. sp.**

Female. Reddish brown, the eyes, tips of mandibles, occiput dorsally and front almost to base of antennæ except a narrow orbital margin, antennæ basally, pronotum in the middle, pecten, mesopleura basally, mesonotum, scutellum, metathorax, 1st abdominal segment and dorsal ridge of 2nd tergite basally black. Head broad and thick, eyes bulging, microscopically reticulate, face radiately striate, pubescent, antennæ 15-segmented, 1st and 2nd segments stout, obconic, touched with black, 3rd segment longest, a little longer than 4th but not as long as 1 and 2 together, following segments progressively shorter, the last, which is fuscous, not much longer than penultimate. Pronotum wide in the middle, rugose and microscopically coriaceous-reticulate, covered with short appressed hairs, mesonotum rugose and distinctly transversely wrinkled, parapsidal grooves complete, median longitudinal lines widely separated and not reaching the middle, smooth lines over base of wings distinct, mesopleura transversely aciculate, pubescent beneath, scutellum rugose, basal foveæ small, oval, smooth at bottom,

approximate, separated only by a carina, metathorax smooth and covered with short appressed hairs. Abdomen longer than head and thorax together, greatly compressed, smooth and shining, 2nd and 3rd tergites connate, reaching apical margin, incised dorsally at apex for one-third the length, exposing the following segments, posterior margin of all the segments minutely punctate, ovipositor sheath projecting obliquely from venter and reaching line of the tergum, ovipositor exerted. Wings hyaline and clothed with rather long, erect hairs, veins distinct and fuscous, radial cell short, closed, vein at base slightly arcuate, areolet small, cubital vein reaching basal. Length 5 mm.

Found in jar with galls from *Quercus lobata*.

Habitat. California.

***Synergus multiplicatus* n. sp.**

Female. Black, the ocelli, face anteriorly, genæ, orbital margin and margin of occiput, antennæ, pronotum (except medially), mesopleura and legs (except hind tibiae and tarsi) yellowish to reddish brown. Head broad, width twice length, coarsely rugoso-punctate, transversely rugose on vertex, antennæ 14-segmented, 1st and 2nd segments obconic, 3rd segment longest, as long as 1 and 2 together and longer than 4th by a half, 5th and following segments progressively shorter, except the last, which is nearly twice as long as penultimate, with fuscous tip. Thorax rugose, mesonotum transversely wrinkled, parapsidal grooves complete, median longitudinal lines and smooth lines over base of wings distinct, mesopleura coarsely aciculate, with small triangular patch beneath wing smooth, fuscous beneath and pubescent, scutellum coarsely rugose, almost coarsely reticulate, foveæ longitudinal, oblique and shallow, bottom rough, not exactly approximate. Abdomen smooth, 2nd and 3rd tergites connate, covering the greater part of the abdomen, 4th tergite narrow posteriorly, all traced with microscopic reticulation, dorsal valve and sheath of ovipositor projecting slightly and pubescent. Wings hyaline, pubescent, veins brownish to black, radial cell closed, vein at base arcuate, areolet small, cubitus not reaching basal vein. Length 1.75-3 mm.

Male. Similar to female except legs infuscate, metanotum black, connate 2nd and 3rd tergites obscuring following segments, brownish on posterior margin and punctate, face yellowish brown instead of reddish brown, length about 2 mm.

Bred from galls of *Cynips kelloggi* on *Quercus douglasi*.

Habitat. Jasper Ridge, near Stanford University, Cal. (R. W. Patterson.) Frohm, Cal. (R. W. Patterson.) Paso Robles, Cal. (John Morehouse.) San Jose, Cal. (R. W. Patterson.)

Synergus varicolor n. sp.

Female. Black, thorax mixed with brown, antennæ (except tip), face below antennæ, genæ, orbital margin broadly, tegulæ, abdomen on ventral and posterior margins and legs wholly brown. Head reticulate, face radiately striate, slightly pubescent, antennæ 14-segmented, 3rd segment longest, longer than 4th, 4th-6th subequal, following segments progressively shorter, except the last, which is a little longer than penultimate. Pronotum wide in the middle, mesonotum rugoso-punctate, pubescent, parapsidal grooves incomplete, reaching half-way to anterior margin, median longitudinal lines and smooth lines over base of wings distinct, mesopleura aciculate anteriorly, posteriorly smooth and shining, scutellum deeply rugose, basal foveæ large, oval, and shallow, bottom rough, contiguous, separated by a carina. Abdomen highly polished, 2nd and 3rd tergites connate, wholly obscuring following segments, line of the tergum only slightly curved, sternal line semicircular, only tip of ovipositor, which is brown, protruding. Wings hyaline, pubescent, radial cell closed, areolet and basal part of cubitus rather indistinct. Length 2.5 mm.

Male. Differs in having 15-segmented antennæ and the head almost entirely, prothorax, mesonotum, mesopleura and ventral and posterior margin of abdomen brown.

Bred from galls of *Callirhytis pomiformis* on *Quercus agrifolia*.

Habitat. Stanford University, Cal. (R. W. Patterson.)

Synergus maculatus n. sp.

Female. Yellowish brown, the eyes, ocelli, tips of mandibles, prosternum, metathorax and abdomen dorsally at apex black. Head finely punctate, face radiately striate, antennæ 14-segmented, 1st and 2nd segments stout, 3rd segment longest, slightly longer than 4th, succeeding segments to 10th progressively shorter, 11th-13th subequal, last somewhat longer than penultimate. Thorax faintly punctate and pubescent, parapsidal grooves incomplete, reaching half-way to anterior margin, scutellum rugose, foveæ indistinct. Abdomen as long as head and thorax together, elliptical when viewed from above, oval as seen from the side, smooth and shining, 2nd and 3rd tergites connate, reaching apex, and almost completely obscuring following segments, dorsal valve and ovipositor sheath conspicuous, slightly protruding. Wings hyaline, veins faint, areolet distinct, faint on two sides, radial cell closed. Length 1.75 mm.

The male differs in having stout 15-segmented antennæ and more black on abdomen dorsally.

Bred from a small, yellowish-brown, depressed globular gall, about 2 mms. in diameter, on upper surface of leaves of *Quercus agrifolia*.

Habitat. Stanford University, Cal. (R. W. Patterson.)

Synergus dubiosus n. sp.

Female. Yellowish brown, eyes, tips of mandibles, occiput dorsally continued on to vertex and front almost to the base of the antennæ, with the exception of a narrow strip on eye, pronotum in the middle, pecten, pleura beneath, mesonotum, scutellum and metathorax entirely, pedicel and abdomen dorsally almost to apex black. Head faintly rugose, sparsely and shallowly punctate on vertex, face radiately striate, pubescent, antennæ 14-segmented, thick but filiform, 1st and 2nd segments stout, 3rd segment long, as long as 1 and 2 together, 3rd-5th subequal, 6th and following segments progressively shorter to last. Pronotum faintly rugose, closely punctate, clothed with short, appressed, whitish pubescence, parapsidal grooves incomplete, reaching more than half-way to anterior margin, median longitudinal lines and smooth lines over base of wings distinct, mesopleura transversely aciculate, scutellum deeply rugose, basal foveæ large, oval and shallow, bottom rough, contiguous, separated by a median carina. Abdomen short, not quite as long as the thorax, smooth and shining, 2nd and 3rd tergites connate, completely concealing following segments, elliptical from above, triangular from side, posterior margin truncate and narrowly punctate. Wings hyaline, pubescent, veins black, radial cell closed, areolet distinct, cubitus not reaching basal vein. Length 4 mm.

The male has 15-segmented antennæ.

Bred from galls of *Callirhytis pomiformis* on *Quercus agrifolia*.
Habitat. Stanford University, Cal. (R. W. Patterson.)

10 **CEROPTRES** Hartig.

Ceroptres, T. Hartig, Zeits. f. Ent., vol. 2 (1840), p. 186, 197.

Face with two parallel ridges from insertion of antennæ to clypeus, beyond these striate, antennæ in female 12-14 segmented, distally thickened, in male 15-segmented, sometimes 14-segmented. Parapsidal grooves usually not reaching anterior margin of mesonotum, scutellum with two basal foveæ. 2nd and 3rd tergites more or less connate, covering nearly the entire abdomen. Radial cell closed, ventral valve short, claws bidentate. Inquilines in galls on *Quercus*.

Ceroptres pomiformis Ashm.

Ceroptres pomiformis, Ashmead, Tr. Am. Ent. Soc., vol. 12 (1885), p. 300.

"Male. Length .05 inch. Slender, head yellowish brown, with a dark brown blotch enclosing ocelli; eyes brown; antennæ 15-jointed, yellowish, with the apical third brown; thorax black, finely pubescent; abdomen bright yellowish brown, infuscated towards tip; wings hyaline, veins yellow, radial area closed, narrow.

"This pretty little species is described from two specimens bred from gall of *Andricus pomiformis* Bass., sent to me from California."
(W. H. Ashmead).

I have not seen examples of this species.

Ceroptres dorsalis Prov.

Ceroptres dorsalis, Provancher, Addit. Hym. Quebec (1888), p. 398.

"♀ Long. .18 pce. D'un beau jaune-miel, avec les yeux, une tache sur le vertex, le lobe médian du mésonotum, le métanotum et une ligne sur le dos des premiers segments de l'abdomen, noir. Les mandibules noires à l'extrémité. Les antennes avec les pattes, jaune sans aucune tache. La face fortement striée et d'un jaune plus pâle. Ailes hyalines, à nervures brunes, légèrement velues, la radiale fermée en avant. Abdomen comprimé, à tarière redressée, dépassant la ligne du dos. Los Angeles (Coquillett).

"Superbe espèce, bien remarquable par sa taille.

"♂ Même coloration que dans la ♀, mais très remarquable par son deuxième segment abdominal qui se développe en une double écaille dépassant l'extrémité de l'abdomen et se prolongeant en dessous d'au moins le double de l'épaisseur des autres segments." (L. Provancher.)

I have not seen examples of this species.

Ceroptres niger n. sp.

Female. Black, femora distally, tarsi, oral margin and sheath of ovipositor brown; somewhat pubescent. Head faintly reticulate and shining, face striate, pubescent, antennæ 13-segmented, 3rd segment as long as 1 and 2 together, longer than 4th, succeeding segments to 10th progressively shorter, 10th and following segments subequal, except the last, which is twice as long as penultimate. Pronotum wide in the middle, rugose, mesonotum faintly reticulate and shining, parapsidal grooves not reaching anterior margin, mesopleura aciculate, a median patch smooth and shining, scutellum coarsely rugose, almost coarsely reticulate, foveæ transverse, large, oval and shallow, with smooth bottom, widely separated. Abdomen smooth and shining, 2nd tergite reaching more than half-way to apex and pubescent at base, 3rd tergite rather wide, 4th and 5th narrow, faintly punctate on posterior margin, ovipositor sheath exerted, dorsal valve conspicuous and pubescent. Legs clothed with pubescence. Wings hyaline, pubescent, radial cell closed, short, basal vein not much curved, areolet present but enclosing veins indistinct, cubitus not reaching basal vein. Length 1.5 mm.

Bred from galls of *Holcaspis eldoradensis* on *Quercus lobata*.

Habitat. Jasper Ridge, near Stanford University, Cal. (R. W. Patterson.)

11 PERICLISTUS Forst.

Aylax (part.), T. Hartig, Zeits. f. Ent., vol. 2 (1840), p. 186, 195.

Periclistus, A. Forster, Verh. Zool. Ges. Wien, vol. 19 Abh. (1869), p. 332, 337.

Face radiately striate, antennæ filiform, in female usually 12-segmented, in male 14-segmented, mesonotum faintly rugoso-punctate and pubescent, parapsidal grooves complete or sometimes not reaching anterior margin, scutellum with two transverse basal foveæ, 1st abdominal segment or petiole deeply striate, 2nd and 3rd tergites connate, covering a large part of the abdomen. Radial cell short, closed. Inquilines in different galls.

Periclistus californicus Ashm.

Periclistus californicus, Ashmead, Tr. Am. Ent. Soc., vol. 23 (1896), p. 188.

"Male and female. Length 2-2.4 mm. Similar to *P. smilacis*, the punctuation finer, the pubescence denser, antennæ dark brown. Legs reddish yellow, sometimes obfuscated, the middle and posterior coxæ black, shining. The parapsidal grooves are only distinct on the posterior half of the mesonotum, entirely wanting anteriorly, and there is no distinct grooved line on the shoulders, while the short anterior median grooves are wanting; scutellum rugose, foveæ large, distinct, oblique; mesopleura smooth, highly polished. Wings hyaline, pubescent, iridescent, veins brown, the areolet large, cubital and marginal cells closed. Abdomen densely black, highly polished.

"Described from nine specimens, labelled No. 125, reared during July, 1886, by Mr. Albert Koebele, from *Rhodites polita* Ashm. and numerous other specimens labelled No. 3839, reared at the Department during January and February, 1886, from the same gall collected in Wyoming and Colorado." (W. H. Ashmead).

I have not seen examples of this species. Doubtfully Californian.

Periclistus obliquus Prov.

Periclistus obliquus, Provancher, Addit. Hym. Quebec (1888), p. 397.

"♀ Long. .10 pce. D'un jaune sale avec une tache au métathorax, les jambes postérieures, surtout à l'extrémité, et l'abdomen en plus ou moins grande partie, noir. La face non striée. Les sillons parapsidaux obliques, se rapprochant en arrière. La radiale ouverte en avant, le radius atteignant le bord costal, l'arcole incomplete. Abdomen presque entièrement noir; la tarière saillante, l'écaille ventrale terminée en pointe fine. Los Angeles (Coquillett)." (L. Provancher).

I have not seen examples of this species.

Periclistus piceus n. sp.

Female. Piceous black, mandibles, tegulæ, femora, tibiæ, tarsi (except at tips), ovipositor and ovipositor sheath brown or brownish. Head microscopically coriaceous-reticulate and pubescent, densely pubescent on face below antennæ and cheeks, antennæ 12-segmented, filiform, 1st segment obconic, 2nd subglobose, stout, 3rd segment as long as 1 and 2 together, 3rd-6th subequal, following segments progressively shorter, except the last, which is more than twice as long as penultimate. Pronotum and mesonotum faintly rugose, thickly clothed with appressed, whitish hairs, pronotum wide in the middle, parapsidal grooves on mesonotum incomplete, reaching less than half-way to anterior margin, median longitudinal lines and lines over base of wings inconspicuous, mesopleura smooth and shining, pubescent above and beneath, scutellum deeply rugose, pubescent, basal foveæ small, circular, shallow, with smooth bottom, contiguous, separated by a carina, metanotum pubescent. Abdomen smooth and shining, 2nd tergite covering the greater part of the abdomen, following tergites very narrow, posterior margin pubescent, ventral valve conspicuous, tuberculate,

sheath of ovipositor projecting upward obliquely to line of tergum. Legs pubescent. Wings hyaline, pubescent, veins fuscous, distinct, radial cell short, closed, vein at base slightly arcuate, areolet distinct, cubitus not reaching basal vein. Length 2.5 mm.

Male. Similar to female, but antennæ 14-segmented, 3rd segment basally emargined, parapsidal grooves in many specimens apparently complete, pubescence more or less sparse.

Bred from galls of *Rhodites politus* on wild rose (*Rosa californica*).

Habitat. Pt. Arena, Cal. (Miss Mabel Patterson.)

Very similar to *P. californicus*, but apparently distinct.

12 DIASTROPHUS Hartig.

Diastrophus, T. Hartig, Zeits. f. Ent., vol. 2 (1840), p. 186, 194.

Face radiately striate, antennæ in female 13-15 segmented, in male 14-15 segmented, pronotum narrow in the middle, mesonotum smooth and shining, bare, parapsidal grooves complete, distinct, scutellum with basal foveæ. Radial cell open at the margin, claws bidentate, ventral valve scarcely as long as wide. Sexual. Galls on *Rubus*, *Potentilla* and *Smilax*.

Diastrophus kincaidi Gillette.

Diastrophus kincaidii, Gillette, Can. Ent., vol. 25 (1893), p. 110.

Diastrophus kincaidi, Kieffer, Bull. Soc. Metz, 2nd ser., vol. 10 (1902), p. 92.

Female. Black, the antennæ, legs (except tips of tarsi), tegulæ and sheath of ovipositor brown or brownish. Head smooth and shining on occiput, vertex and front to insertion of antennæ, face radiately striate and pubescent, pubescence extending on to genæ, antennæ 13-segmented, 1st and 2nd segments stout, 1st obconic, 2nd globose, 3rd segment long, as long as 1 and 2 together, following segments progressively shorter to last, which is considerably longer than penultimate; all the segments more or less pubescent, distally from the middle infusate. Pronotum wide in the middle, aciculate at the sides, pubescent, mesonotum smooth and shining, parapsidal grooves complete, rather widely separated at scutellum, median longitudinal lines and smooth lines over base of wings distinct, mesopleura transversely aciculate and shining, scutellum evenly rugose, basal foveæ oblique, oval, with smooth shining bottom, contiguous, separated by a median carina, metanotum rugose and bare. Abdomen smooth and shining, dorsally depressed, 2nd tergite reaching more than half-way to apex, 3rd tergite rather broad, ovipositor slightly protruding. Legs pubescent. Wings hyaline, pubescent, faintly iridescent, veins brownish, radial cell open at the margin, vein at base almost straight, areolet distinct, cubitus reaching basal vein. Length 3 mm.

The male has 14-segmented antennæ, of which the 3rd segment is basally emargined.

Gall. Large galls surrounding the stem of the thimbleberry (*Rubus nutkanus*), 25-60 mm. long and 12-25 mm. in diameter. Polythalamous.

Habitat. Pt. Arena, Cal. (Miss Mabel Patterson.) Alameda County, California. (Beutenmüller.)

13 **COMPSODRYOXENUS** Ashm.

Compsodryoxenus, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 128.

Head confluent punctate or faintly rugose, antennæ filiform, 13-14 segmented, thorax closely and confluent punctate or faintly rugose, parapsidal grooves shallow but distinct, pleura punctate, scutellum rugose, abdomen compressed, ventral valve prominent, sharply pointed, plowshare-shaped. Radial cell open, vein at base arcuate and surrounded by a brown cloud, margin of basal vein clouded and a brown spot before the break in the anal vein. Claws simple. Galls on *Quercus*.

Compsodryoxenus brunneus Ashm.

Compsodryoxenus brunneus, Ashmead, Proc. U. S. Nat. Mus., vol. 19 (1896), p. 129.

"Galls. The gall of this species was likewise confused in the collection with a similar gall (*Andricus chrysolepidis*) occurring on *Q. chrysolepis* in California, but I can distinguish two kinds of galls, although both bear the same number (2972). Both are very much alike externally, but one is polythalamous, the other monothalamous, and I believe the latter is the one producing the present gall-fly.

"Gall-fly. Female. Length, 2 to 2.6 mm. Head, antennæ, thorax, and legs pale or light brown, the antennæ towards tips dusky, pleura blackish, the abdomen black, polished, the posterior legs dusky or darker than the other. Wings hyaline, marked as in previous species.

"The species is closely allied to the preceding, but it is smaller, paler colored, and has 13 joints in the antennæ.

"Type No. 3085, U. S. N. M.

"Specimens reared June 9, 1883, (?1893). Under this number the record book contains the following: January 13, 1893, Received today from Mr. H. W. Turner, of Martinez, California, a lot of elongate, oval twig galls, found on scrub oak; some of them were collected January 3rd in Pine Canyon, Mt. Diabalo Contra Costa County, and some from apparently the same species of oak at Martinez; placed galls from different localities into different bottles to breed." (W. H. Ashmead).

I have not seen examples of this species.

14 **RHODITES** Hartig.

Cynips (part.), Linne, Syst. Nat., ed. 10 (1758), p. 343, 553.

Rhodites, Aylax (part.), T. Hartig, Zeits. f. Ent., vol. 2 (1840), p. 186, 194.

Head large, broader than the thorax, antennæ 14-15 segmented, pronotum narrow in the middle, parapsidal grooves complete or not reaching anterior margin, deep longitudinal groove beneath on mesopleura, scutellum with basal foveæ or a wide transverse groove, abdomen smooth in female, strongly compressed apically, sternite of last segment plowshare-shaped, broad at the base and gradually narrowing to a point, abdomen in male small, compressed and rounded apically. Radial cell closed, short. Claws simple. Galls on *Rosa*.

Rhodites bicolor (W. Harr.)

Cynips bicolor, T. W. Harris, Treat. Ins. N. Engl. (1842), p. 399.

Rhodites bicolor, Osten-Sacken, Proc. Ent. Soc. Philad., vol. 2 (1862), p. 43, 48.

Rhodites spinosellus, Cockerell, Entomol., vol. 23 (1890), p. 75.

Female. Black, tips of mandibles, palpi, ocelli, legs (except coxæ, trochanters and tips of tarsi), tegulæ and abdomen reddish brown. Head faintly punctate on occiput, vertex and front to insertion of antennæ, face and genæ coarsely punctate and clothed with silvery pubescence, antennæ 14-segmented, 1st and 2nd segments stout, 2nd globose, 3rd segment longest, much longer than 4th and nearly twice as long as 1 and 2 together, succeeding segments to 9th progressively shorter, 9th and following segments subequal, except the last, which is much longer than penultimate; all the segments rather thick. Pronotum narrow in the middle, punctate and pubescent, mesonotum elevated, rugoso-punctate, faintly pubescent, parapsidal grooves reaching more than half-way to anterior margin, median groove from posterior margin shorter, not extending beyond the middle, median longitudinal lines and smooth lines over base of wings distinct, mesopleura rugose and faintly pubescent, smooth, bare patches in the middle and beneath, scutellum deeply rugose, basal foveæ wanting, sharp declivity on either side at base smooth and shining, metanotum rugose and pubescent. Abdomen compressed, smooth and shining, 2nd tergite reaching half-way to apex, 3rd and following tergites fairly wide, valves touched with black. Wings subhyaline, pubescent, iridescent, veins brownish, radial cell short, closed, vein at base angulate, arcolet distinct, cubitus reaching basal vein. Length 5 mm.

Male. Similar to female but antennæ and abdomen piceous black, legs more or less fuscous, wings hyaline, nervures black.

Gall. Spiny galls occurring in clusters on the wild rose (*Rosa californica*); yellowish brown, body spherical, the spines as long as or longer, sometimes shorter than the diameter of the body. Monothalamous.

Habitat. Stevens Creek, above Cupertino, Cal. (R. W. Patterson.)

Rhodites politus Ashm.

Rhodites polita, Ashmead, Bull. 1, Colo. Biol. Assoc. (1890), p. 14, 38.

Rhodites politus, Beutenmüller, Bull. Am. Mus. Nat. Hist., vol. 23 (1907), p. 644.

Female. Black, the legs reddish brown outwardly from base of femora. Head faintly punctate, face pubescent, antennæ 14-segmented, filiform, 3rd segment longest, nearly twice as long as 4th or 1 and 2 together, following segments progressively shorter, except the last, which is nearly twice penultimate. Pronotum narrow in the middle, closely punctate and pubescent, mesonotum sparsely and shallowly punctate, each puncture bearing a short hair, parapsidal grooves complete, median longitudinal lines rather short, mesopleura finely rugoso-punctate, the disc bare and highly polished, scutellum rugoso-punctate

much longer than wide. Abdomen smooth and shining, compressed beneath, ventral valve projecting and acutely pointed. Wings hyaline, pubescent, veins brownish black, radial cell short, closed, with a brownish cloud, vein at base angulate, areolet distinct, cubitus reaching basal vein. Length 3 mm.

Gall. Small globular galls with weak spines, on leaves of wild rose (*Rosa californica*), often in tangled clusters.

Habitat. Pt. Arena, Cal. (Miss Mabel Patterson.) Los Angeles. (Beutenmüller.)

15 LYTORHODITES Kieff.

Lytorhodites, Kieffer, Bull. Soc. Metz, ser. 2, vol. 10 (1902), p. 96.

Differs from *Rhodites* only in the following particulars: scutellum without foveae, radial cell more or less open at the margin, abdomen usually faintly reticulate. Galls on *Rosa*.

Lytorhodites arefactus (Gillette).

Rhodites arefactus, Gillette, Can. Ent., vol. 26 (1894), p. 157.

Lytorhodites arefactus, Kieffer, Bull. Soc. Metz., ser. 2, vol. 10 (1902), p. 97.

Rhodites similis, Beutenmüller, Bull. Am. Mus. Nat. Hist., vol. 23 (1907) p. 640.

"The galls are dense, corky enlargements of small shoots, usually close to the stem from which the shoot arises, and the shoot is usually dead beyond the gall when the latter is mature. The galls are irregular in shape, vary from one-half to seven-eighths of an inch in diameter, and are polythalamous. The surface is of a rusty color, is finely wrinkled, and reminds me of dried fruit. The surface appears dry and hard, but it is easily dented with the finger-nail and is always free from spines.

"Described from eighteen galls collected in March in the vicinity of Fort Collins, Colorado. Galls brought into the laboratory March 7th began giving flies March 23rd.

"Gall-flies. Females. General color cinnamon-rufous; head entirely rufous, except a blackish area between either compound eye and the mouth; under a power of 60 diameters the lower face appears rather coarsely wrinkled, the wrinkles converging towards the mouth, the upper face, vertex and occiput very finely rugose; the face sparsely set with a short gray pubescence; antennæ short, the first three joints, and sometimes the base of the third, rufous, the remaining joints black; number of joints, 14. Thorax rufous above, with a black suture separating the mesothorax and scutellum, parapsidal grooves entire, broad, moderately deep, well separated at the scutellum, and with numerous elevated lines crossing them; median grooves distinct and extending well forward. The surface of the thorax is finely rugose, and, in a proper light, shows numerous punctures, each puncture bearing a short yellowish hair. Scutellum coarsely wrinkled near the margin and less coarsely wrinkled on the central portion, which is considerably elevated, transverse groove at base, color rufous. Mesopleura, except spot just beneath the wings, rufous, sutures, metathorax and sternum black or blackish;

entire pleura rugose. Abdomen rufous, with venter and posterior half of dorsum blackish, all abdominal segments covered with a microscopic network of impressed lines, most prominent on the terminal segments. Wings but little smoky, radial area not at all closed along the costal margin, areolet distinct and rather small. Feet, including the coxæ, entirely rufous, the claws only being black. Length from $3\frac{1}{2}$ to $4\frac{1}{2}$ mm.

"Described from twenty-one specimens bred from the galls.

"Males. Three to three and one-half mm. in length, black, feet more reddish in color than in the females, bases of the coxæ black, antennæ black throughout; otherwise like the females.

"Described from forty-two bred specimens.

"There is one male among those reared that has the rufous marking of the female on head, antennæ and thorax.

"This species resembles very closely *Rhodites multispinosa* Gill., but the galls are very different." (C. P. Gillette).

I have not seen examples of this species.

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